Enclosure to:
JWS-02-035

JWR-02-007
JEX01

Multinational Collaboration Limited Objective Experiment I

(MN LOE I)

Final Report

February 2002

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
01 FEB 2002	**Final**	**31 OCT 2001 - 16 NOV 2001**

4. TITLE AND SUBTITLE
Multinational Collaboration Limited Objective Experiment I (MN LOE I)

5a. CONTRACT NUMBER
5b. GRANT NUMBER
5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
C. O. Salamacha, G. R. DiPietro, M. A. Harlow, C. H. Sinex, K. Curtis,

5d. PROJECT NUMBER
5e. TASK NUMBER
5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Joint Warfare Analysis Department, The Johns Hopkins University - Applied Physics Laboratory, Johns Hopkins Road, Laurel, Maryland

8. PERFORMING ORGANIZATION REPORT NUMBER
JWR-02-007, JEX01

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
USJFCOM J9 Joint Concept Development and Experimentation, Suffolk, VA

10. SPONSOR/MONITOR'S ACRONYM(S)
11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
The original document contains color images.

14. ABSTRACT
Multinational Limited Objective Experiment (MN LOE) I was the first of a series of Joint Futures Lab/J9 LOEs to be conducted with multinational partners. The strategy adopted for examining collaborative planning in MN LOE I was to have two distributed planning teams concurrently employing two different planning processes.

15. SUBJECT TERMS
multinational, experiment, MNE, distributed, collaboration, operational planning

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**UU**	**136**	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18

JWR-02-007
JEX01

Multinational Collaboration
Limited Objective Experiment I

(MN LOE I)

Final Report

February 2002

Prepared by:
C. O. Salamacha
G. R. DiPietro
M. A. Harlow
C. H. Sinex

Contributions:
K. Curtis, MITRE, J9

JOINT WARFARE ANALYSIS DEPARTMENT
THE JOHNS HOPKINS UNIVERSITY • APPLIED PHYSICS LABORATORY
Johns Hopkins Road, Laurel, Maryland 20723-6099

Table Of Contents

Section **Page**

Table Of Contents (Continued)

Section **Page**

List Of Figures

Figure **Page**

List Of Tables

Table **Page**

EXECUTIVE SUMMARY

The first United States Joint Forces Command (USJFCOM) Multinational Limited Objective Experiment (MN LOE) I was conducted 31 October – 16 November 2001. MN LOE I was the first of a series of Joint Futures Lab/J9 LOEs to be conducted with multinational partners to define coalition participation in Olympic Challenge 2004. The participants in MN LOE I - Australia (AUS), Canada (CA) (as an observer), Germany (GE), the United Kingdom (UK), and the United States (US) - are all members of the Multinational Interoperability Council (MIC). The experiment was conducted in a distributed environment; the US planning cells were located at the Joint Battle Center in Suffolk, Virginia and the Australian, UK, German, and Canadian cells were located in Fern Hill Park, Portsdown West, Potsdam, and Ottawa, respectively.

MN LOE I was comprised of seven independent planning sessions. Each session addressed a situation or vignette for which the multinational coalition conducted Mission Analysis and developed a Course of Action. Given that MN LOE I was an unclassified experiment the vignettes developed for the experiment were restricted to Military Operations Other Than War (MOOTW), in particular humanitarian operations.

The strategy adopted for examining collaborative planning in MN LOE I was to have two planning teams, Traditional and Integrated, conduct planning concurrently. The Traditional planning team used a process based on the Lead Nation concept described in the Multinational Interoperability Working Group (MIWG) white paper whereas the Integrated Planning Team used an experimental process based on Rapid Decisive Operations (RDO) Standing Joint Command and Control Element (SJC2E) concepts. Both teams focused on Mission Analysis (MA) and Course of Action (COA) development.

Three Critical Operational Issues (COIs) were examined in MN LOE I:

COI #1: With the introduction of collaborative tools, did the Traditional and Integrated planning processes evolve into similar processes [from the perspective of multinational collaboration] or were they different?

COI #2: Assuming both planning processes are equipped with the same collaboration capability, does the quality of the COAs produced by the Traditional and Integrated planning processes differ as a function of length of planning window and type of operation?

COI #3: Given its distributed structure, did MN LOE I demonstrate that collaborative planning can be conducted successfully in a distributed environment?

Significant findings for the three COIs were:

COI #1:

- The Traditional and Integrated processes followed in MN LOE I demonstrated significant similarities as well as differences, and consequently a definitive comparison of the two processes proved to be challenging. The processes did exhibit noteworthy differences in the areas of leadership and situational awareness. Issues related to leadership have potential implications for doctrine, procedures and training.
- Largely due to the collaboration tools, the Traditional process followed in MN LOE I was more integrated in nature than the conventional 'stove-piped' approach typically associated with the Lead Nation concept. Further investigation is required to assess whether given the availability of a robust collaboration environment and a commonly defined product, the Traditional process might naturally evolve into something similar to the Integrated process.
- The infrastructure implications related to maintaining continuous situational awareness of team activity merits further study. System and network performance data collected during MN LOE I should prove very useful in this endeavor.
- By design, planning during MN LOE I was primarily conducted at the operational level. It would be of value to examine the adaptation of the Integrated process to the tactical level (i.e., more detailed, real-time planning).

COI #2:

- A panel of senior subject matter experts (the "Graybeards") who evaluated the COAs generated during MN LOE I marginally preferred the COAs produced by the Integrated team, citing completeness as a critical factor. Given the small size of the graybeard panel (five), statistical significance cannot be assigned to most of the individual vignette scores. Two exceptions are Vignettes E and H, where a significant majority of the experts selected the COAs produced by the Integrated team.
- Detailed analysis of the panel's evaluations did not provide a definitive explanation of the factors(s) which caused the graybeards to prefer the Integrated COAs. The examination of the types of operations and lengths of planning window represented in the seven vignettes did not suggest an overall trend that would readily explain the graybeard selections.
- Potential explanations of the panel's evaluations that merit further investigation are:
  - The Integrated process may be better suited to low intensity operations (i.e., humanitarian) such as those examined in the LOE.
  - The Integrated team had the advantage of pre-LOE training in a process that remained relatively stable throughout the LOE.
  - The Integrated team was able to better retain corporate knowledge and leverage off previous planning efforts.

COI #3:

- MN LOE I demonstrated that collaborative planning can be conducted in a distributed environment.

- Even with this positive result, the potential adverse impact of computer system problems and network congestion on the planning processes should be neither ignored nor minimized. Additional study that leverages off insights gathered during MN LOE I is required to develop a better understanding of the system requirements associated with supporting distributed planning, especially at the level represented in the Integrated process. Likewise, additional study is required to address the unique management issues associated with conducting a LOE in a distributed environment.
- By design the exchange of classified data was not addressed in MN LOE I, but will need to be explored in future LOEs.

MN LOE I was unique since it was a focused discovery experiment structured to examine a specific aspect of the RDO concept, distributed planning with multinational partners. MN LOE I was also a pilot event in that it attempted a global distributed experiment linking sites that had never been linked using a relatively new collaboration tool and approach. The MN LOE took an innovative approach for controlling the experiment by relying on a distributed virtual control cell in lieu of the more traditional centralized approach. Finally, the MN LOE served as a venue for focused research topics of national interest. The feedback collected from participants and observers of MN LOE I and the attendees of the Analysis Workshop provided The Johns Hopkins University Applied Physics Laboratory (JHU/APL) analysis team with many valuable recommendations that will ultimately benefit future LOEs. The detailed discussion of recommendations provided in Section 4 includes the following key recommendations:

- Having a point of participation in each nation facilitated the availability of national staff to participate in the MN LOE. This coupled with the insight gained about multinational planning in a distributed environment make a compelling argument for designing future MN LOEs with a similar distributed structure.
- Several topics worthy of additional investigation were identified during the analysis of MN LOE I. It is recommended that J9 consider the following:
  - Given the availability of a robust collaboration environment and a commonly defined process, might the Traditional process naturally evolve into something similar to the Integrated process and if not, what are the major obstacles? In particular, the role of the lead nation as a *leader* needs to be explored further in the Integrated process.
  - What are the infrastructure implications associated with maintaining continuous situational awareness of team activity as demonstrated in the Integrated process?
- The MN LOEs are critical to examining and demonstrating the value and viability of proposed RDO concepts. If a comparison of new concepts against more 'traditional' concepts is not part of the LOE structure, then a comparative assessment will need to be obtained through some other means.
- A planning roadmap for Olympic Challenge'04 that includes the MN LOEs is critical to ensuring that the objectives of the individual MN LOEs support the larger objectives defined for Olympic Challenge '04. Also, it is of paramount importance to start planning for the MN LOEs as soon as possible. An early start is necessary to ensure that critical issues (e.g., migration to a classified environment, staffing requirements, 1- vs. 2-process structure) are addressed early in the process, thus increasing the potential for successful resolution.

Intentionally Left Blank

Section 1

INTRODUCTION

1.1 INTRODUCTION

The first United States Joint Forces Command (USJFCOM) Multinational Limited Objective Experiment (MN LOE) I was conducted 31 October – 16 November 2001. MN LOE I is the first of a series of Joint Futures Lab (J9) LOEs conducted with multinational partners to define coalition participation in Olympic Challenge 2004. The participants of MN LOE I, Australia (AUS), Canada (CA), Germany (GE), the United Kingdom (UK), and the United States (US), are all members of the Multinational Interoperability Council (MIC).[1]

Section 1 of this report describes the objectives, experiment design, evaluation strategy, and data collection strategy defined for MN LOE I. Section 2 provides an overview of the events that occurred during the initial training session and the two weeks of planning sessions comprising the LOE. MN LOE I analysis strategy and findings are detailed in Section 3, and Section 4 provides a summary of recommendations compiled during the experiment and the subsequent analysis phase that are relevant to the planning of future LOEs.

1.2 MN LOE I OBJECTIVES

One of the key objectives of MN LOE I was for the multinational participants and J9 to successfully design and conduct a multinational experiment. An equally critical objective of MN LOE I was to explore collaboration with coalition partners during Rapid Decisive Operations (RDO)[2] planning. The strategy adopted for examining collaborative planning in MN LOE I was to have two planning teams, Traditional and Integrated, conduct planning concurrently. The Traditional planning team would use a process based on the Lead Nation concept described in the Multinational Interoperability Working Group (MIWG) white paper[3] whereas the Integrated Planning Team would use an experimental process based on RDO Standing Joint Command and Control Element (SJC2E) concepts.[4] Both teams would focus on Mission Analysis (MA) and Course of Action (COA) development.

---

[1] Canada sent observers to MN LOE I. France, also a member of the MIC, did not participate in MN LOE I.

[2] "Rapid Decisive Operations is a joint operational concept for future operations. A rapid decisive operation will integrate knowledge, command and control, and effects-based operations to achieve the desired political/military effect. In preparing for and conducting a rapid decisive operation, the military acts in concert with and leverages the other instruments of national power to understand and reduce the adversary's critical capabilities and coherence. The United States and its allies asymmetrically assault the adversary from directions and in dimensions against which he has no counter, dictating the terms and tempo of the operation. The adversary, suffering from the loss of coherence and unable to achieve his objectives, chooses to cease actions that are against US interests or has his capabilities defeated." U. S. JFCOM J-9 Joint Futures Laboratory, *A Concept for Rapid Decisive Operations* (Draft), RDO Whitepaper Version 2.0, pp. ii

[3] "MIWG Report to the Multinational Interoperability Council Topic: The Lead Nation Concept in Coalition Operations," 20 December 2000.

[4] J9 training materials for the RDO SJC2E concepts are provided in Appendix A.

1.2.1 MN LOE I CRITICAL OPERATIONAL ISSUES

During final planning of MN LOE I it was decided to allow the Traditional process to adapt freely to the collaborative environment and not constrain the process by static, common operating procedures. Consequently, COI #1 was factored into the data collection and analysis effort to track the evolution of the processes over the course of the experiment:

COI #1: With the introduction of the collaborative tool, did the Traditional and Integrated planning processes evolve into similar[5] processes [from the perspective of multinational collaboration] or were they different?

The second COI formulates the comparison of the two planning processes examined in the LOE.

COI #2: Assuming both processes are equipped with the same collaboration capability, does the quality of the COAs (completeness, accuracy and suitability) produced by the Traditional and Integrated planning processes differ as a function of length of planning window and type of operation? Specifically, does one process produce a better product (i.e., Course of Action) when planning time is short?

During MN LOE I the national planning cells operated from sites in their own countries: Joint Battle Center (JBC) (US), Portsdown West (UK), Potsdam (GE) and Fern Hill Park (AUS). Given its distributed structure, MN LOE I provided an excellent opportunity to explore the following Critical Operational Issue:

COI #3: Can collaborative planning be conducted successfully in a distributed environment?

1.3 EXPERIMENT DESIGN

1.3.1 SCENARIO AND VIGNETTES

MN LOE I was conducted as a series of independent planning sessions. Each session addressed a situation or vignette for which the multinational coalition conducted Mission Analysis and developed a COA. The initial step in developing the vignettes for MN LOE I was to identify potential operations and geographic areas to be used as the framework for each vignette. All vignettes developed for MN LOE I assumed the operational environment defined in the Pacifica scenario[6]. Given that MN LOE I was an unclassified experiment, the vignettes

[5] The planning processes are complex and the assessment of 'similar' versus 'different' is based on a set of characteristics common to both processes: Organizational Structure, Use of Tool, Schedule of Events, Role of Lead Nation, Impact of Lead Nation on Process, Effectiveness of Inter-Country Interactions, Effectiveness of Intra-Country Interactions, and Balance in Skills/Experience/Background of Team Members. A detailed comparison of the two processes demonstrated during MN LOE I is provided in Section 3: Analysis Results.

[6] Summary of Pacifica scenario: (South Pacific) The country of Pacifica is depicted as a vital and important trading and security partner of the United States. Pacifica is presently experiencing a civil war that is concentrated on the

developed for the experiment were restricted to Military Operations Other Than War (MOOTW)[7], in particular humanitarian operations. The military operations defined for Pacifica served as a background, ongoing Joint Task Force effort, while the contingencies defined for the vignettes spanned the spectrum of MOOTW. Countries within 1200 nm of the Philippines (fictitious Pacifica) were identified as candidate locations. An analysis of the situations allowed under MOOTW and political sensitivities associated with the South Pacific region (based on feedback from LOE participants) motivated the design team to exclude certain operation/country combinations from consideration.

Additional guidelines regarding vignette development specified that all vignettes should be of comparable complexity and represent unique operational situations that do not leverage off previous vignettes. These requirements were intended to ensure that evaluation results from all planning sessions could be combined on an equal basis to develop an overall comparison of the two planning processes. If vignettes represented comparable planning challenges, the different length planning windows ranging from 6 to 10 hours would provide valuable insight into the quality of COA product as a function of length of planning window.

1.3.2 MN LOE I ARCHITECTURE

The network architecture developed for MN LOE I is depicted in Figure 1-1. Collaborative planning was conducted over the classified Combined Federated Battle Lab Network (CFBLNet)[8], denoted in the diagram as a 'cloud' linking the five LOE sites. The US planning cells and the LOE white cell[9] were located at the Joint Battle Center in Suffolk, Virginia. The Australian, UK, German, and Canadian cells were located in Fern Hill Park, Portsdown West, Potsdam, and Otttawa, respectively.

---

island of Luzon, and an insurgency that began on the island of Mindanao and over time has spread throughout the country. The current scenario includes the events leading to the deployment of US Special Operations Force (SOF) training teams to assist the Republic of Pacifica (ROP) in its counterinsurgency effort. It also provides background information leading to the eventual employment of a US-led multinational task force committed to defeat an armed invasion of Pacifica by neighboring Surran.

[7] Operations specified in Joint Pub 3-07, "Joint Doctrine for Military Operations Other Than War."

[8] The CFBL Initiative is a consortium developed between the US, NATO and CCEB Nations. "The CFBLNet is a longer-term combined RDT&E network. It is not intended to be a combatant network or the architecture for a future network. This network is projected to remain in operation to conduct coalition C4I experiments and provide possible parallel use in CINC coalition exercises. Creation of the CFBLNet leverages Joint Warrior Interoperability Demonstration (JWID) resources, existing US Federated Battle Laboratories assets and coalition battle laboratories/test beds. As such it will not be a solely US owned/operated network, but a combined network with the members having equal say in its utilization and management. NATO nations participating in bilateral or multilateral CFBLNet project arrangements are responsible for funding their portion of the effort and there is no requirement for monies to be exchanged among participants. The NATO point of entry for CFBLNet is NC3A The Hague." [Joint Warrior Interoperability Demonstration 2002 website, http://www.jwid.js.mil/html/cfblnet.html.]
CFBLNet was chosen for MN LOE I because it is the only established and accredited wide area network available for experimentation with multinational partners.

[9] The white cell was comprised of a team operating as the staff of the Supreme Allied Commander Asia Pacifica (SACAPAC), the analysis team led by JHU/APL and technical personnel monitoring network and system performance.

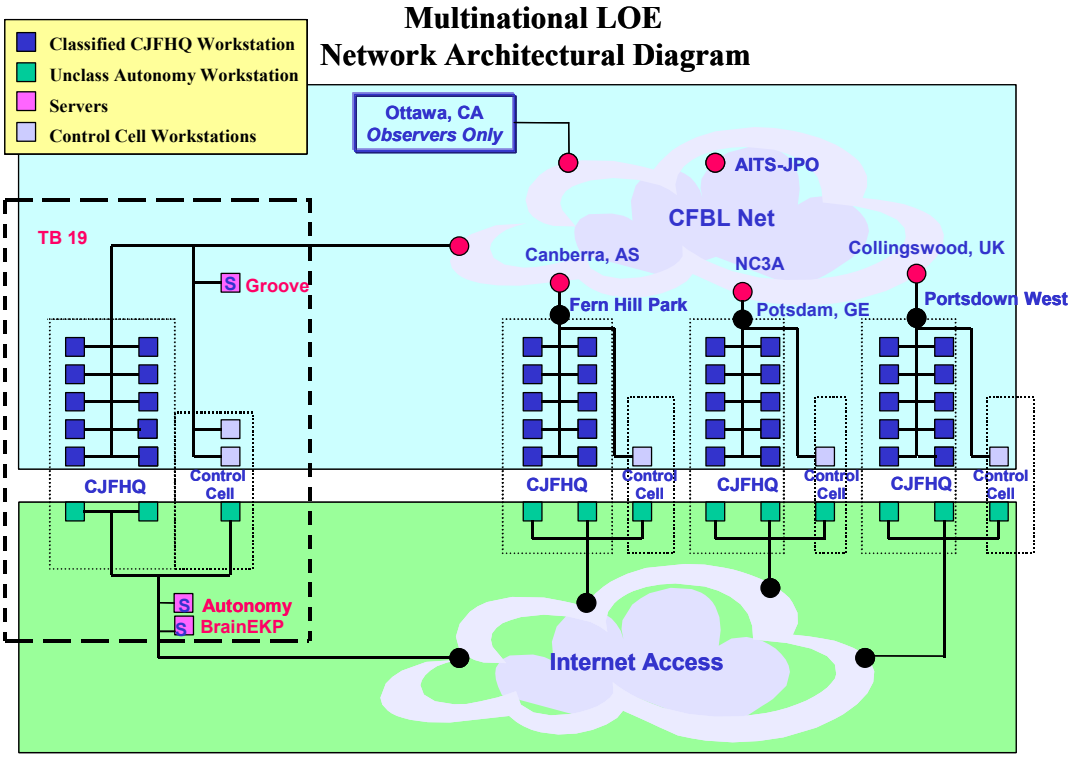


Figure 1-1: MN LOE I Network Architecture

Both planning teams at each site were equipped with Groove, a commercial collaboration product that supports peer-to-peer communications and provides centralized system management.[10] Pre-LOE expectations regarding the use of Groove spaces are depicted in Figure 1-2. Each participant had access to Groove from his or her workstation. Each national planning cell was assigned its own planning environment (i.e., shared space) while common shared spaces were established for the Integrated team. Prior to the LOE it was envisioned that the Traditional national cells (US, UK, AUS, and GE) would operate primarily in their national spaces, with the lead country selectively inviting other countries into its space. The Integrated team would operate in a central shared space as well as shared spaces dedicated to planning, intelligence, and logistics activities. How the teams actually used their spaces during the LOE is addressed in Sections 2 and 3.

[10] Groove product information available at http://www.groove.net.

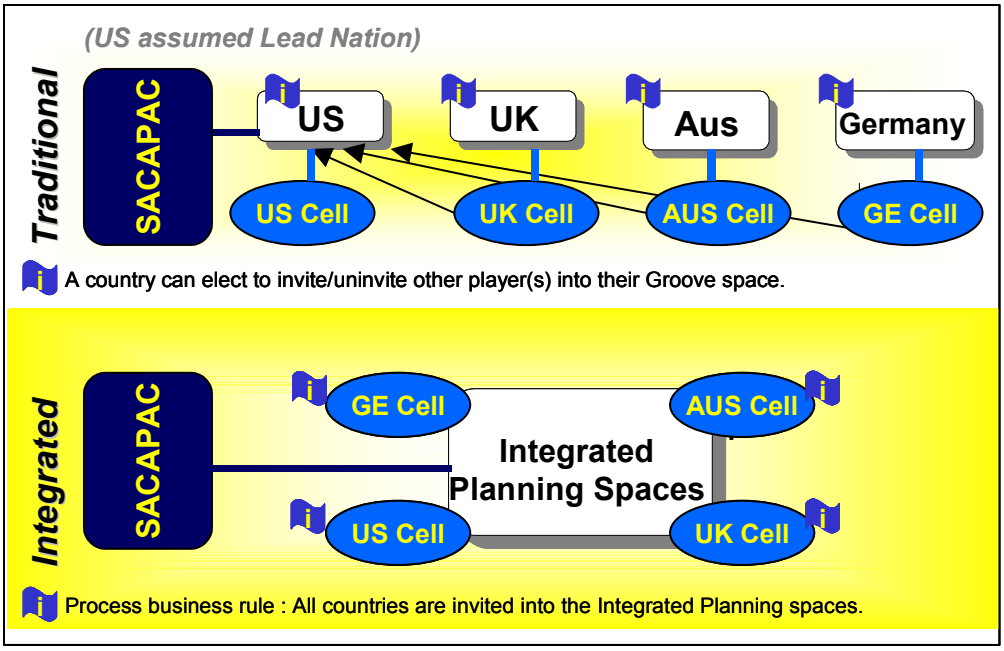


Figure 1-2: Anticipated Uses of Groove Spaces

The structures of the shared spaces were established prior to the LOE and were not modified by the participants. All shared paces provided the following tools: Notepad, Threaded Discussion, Agenda/Outliner, Whiteboard, Text Chat, Messaging and Audio. In addition to collaborative planning among team members, the shared spaces also supported information exchanges between the teams and the Supreme Allied Commander Asia Pacific (SACAPAC).

Each national cell also had unclassified access to the World Wide Web (www) to conduct open source research. Each cell had an unclassified workstation equipped with BrainEKP (formerly called Team Brain), Autonomy and other www browsers. In lieu of a true Operational Net Assessment for the geographic areas specified in the vignettes, a relational database was constructed inside BrainEKP[11] that provided background data for these areas. A manual data mining effort on the unclassified, open source www resulted in approximately 500 URLs for ten South Pacific countries. These URLS were catalogued by the five PMSEI (Political, Military, Social, Economic, and Infrastructure) categories. Autonomy Portal-in-a-

[11] "BrainEKP is composed of four key components:
- Universal Data Access – enables the integration of information from many sources
- Integrated Collaboration – enables communication in the same place where information is created, stored, and accessed
- Knowledge Model – enables a shared understanding of how everything is connected, accessed, processed, and used
- Visual User Interface – enables people to easily use and navigate the system, and see how everything fits together in context "(http://www.thebrain.com/products/brainEKP).

Box[12] provided an additional means of conducting focused open source research for the countries and situations considered in the vignettes.

1.3.3 VIGNETTE SCHEDULE

The LOE schedule, detailed in Figure 2-1 (Section 2), included eight vignettes (Vignettes C through J) that ranged from 6 to 10 hours[13]. Two additional vignettes were included in the training session conducted the week prior to the LOE. At the beginning of each planning session SACAPAC issued a warning order that summarized the operation and the objectives to be addressed in the COA. The warning order also specified times when the Mission Analysis products (primarily a revised Mission Statement) and the Course of Action were to be delivered to SACAPAC. The teams could initiate contact with SACAPAC whenever they chose and during the second week SACAPAC introduced periodic updates ("injects") to the operational situation. At the end of each vignette the participants completed evaluation questionnaires. These questionnaires solicited feedback about the COAs produced during the vignette and the planning process that was used, as well comments pertaining to LOE experiment design and structure. Participants had an opportunity to update their responses the following day, prior to the start of the next vignette. Other surveys administered during MN LOE I are discussed in Section 1.5.

1.4 EVALUATION STRATEGY

1.4.1 COI #1

"With the introduction of the collaborative tool, did the Traditional and Integrated planning processes evolve into similar processes [from the perspective of multinational collaboration] or were they different?

As stated previously, three COIs were specified for MN LOE I. COI#1 addresses the similarities and the differences of the two planning process observed during MN LOE I. Given the complex and at times dynamic nature of the processes, the Traditional and Integrated processes are evaluated on the basis of eight common characteristics: Organizational Structure, Use of Tool, Schedule of Events, Role of Lead Nation, Impact of Lead Nation on Process, Effectiveness of Inter-Country Interactions, Effectiveness of Intra-Country Interactions, and Balance in Skills/Experience/Background of Team Members. The comparison of the two processes is based on these eight characteristics.

[12] "Autonomy Portal-in-a-Box™ delivers the most comprehensive and automated Information Portal for both inside and outside the firewall in one easy to use package. Based on Autonomy 's unique pattern-recognition technology that automatically analyzes information based on its content, Autonomy Portal-in-a-Box ™is the only portal solution able to automate the most critical processes including categorization, personalization, hypertext link management, and highly personalized information delivery." [http://www.autonomy.com]

[13] Originally the length of the vignettes was expected to range from 6 to 12 hours. After the start of the LOE the control cell decided to limit the vignettes to no more than 10 hours. This was done in an attempt to establish an operational tempo for the LOE that would keep players sufficiently engaged.

1.4.2 COI #2

"Assuming both processes are equipped with the same collaboration capability, does the quality of the COAs produced by the Traditional and Integrated planning processes differ as a function of length of planning window and type of operation? Specifically, does one process produce a better product (i.e. Course of Action) when planning time is short?

COI#2 requires a comparative assessment of the Courses of Action developed by the two teams. The evaluation of the COAs is based on three Measures of Effectiveness (MOEs): completeness, accuracy and suitability.

- Suitability: "Does the COA support the Commander's intent and desired end-state? Is the COA acceptable to multinational partners and the host country?"
- Completeness: "Does the COA lack certain relevant and critical information?"
- Accuracy: "Does the COA include errors due to incorrect information or assumptions?"

The evaluation strategy adopted for MN LOE I was to have all evaluators, a panel of senior subject matter experts (a.k.a. gray beards) and LOE participants, evaluate the COAs produced by the two teams. The evaluators would apply the three MOEs to the three sections of the COA (see Table 1-1) and identify any and all deficiencies. Factors to be considered when completing the evaluation questionnaire were provided as guidance (see Figure 1-3), but primarily the evaluators were expected to base their critiques on personal operational experience.

Table 1-1

COA Template

COA Sections	COA Sub-sections
I: CONOPS/Tasks	Summary of Concept of Operations
	Anticipated End-State
	Tasks and Supporting Commander
	ROE Considerations
	Potential Adverse Activity
	Information sources and assumptions
II: Requirements	Forces Required; Considerations
	Logistics; Considerations
	Intelligence; Considerations
	Other; Considerations
	Infrastructure Requirements/Shortfalls
	Anticipated Host Country Support
	Information sources and assumptions
III. Likelihood of Success	Likelihood COA Will Succeed
	Anticipated Timeframe for Completion
	Rationale: Constraints
	Rationale: Risks
	Information sources and assumptions

COA Components	MOEs: Completeness	MOEs: Accuracy	MOEs: Suitability
Actions	**Factors to consider include:** Omissions of critical actions required to address unique operational situation, critical data sources not considered, specification of chronology of events, etc.	**Factors to consider include**: Use of erroneous data/assumptions or incorrect interpretation of information in developing action plan	**Factors to conside include:** Support of Commander's intent, support of desired end state, consistency with guidance/checklists provided in Joint Doctrine publications, etc.
Requirements	**Factors to consider include:** Omissions in support requirements, critical data sources not considered	**Factors to consider include:** Errors in determining impact of COA on Pacifica mission, Errors in assessment of MNF capabilities/resources, Errors on assessment of host country capabilities/resources	**Factors to consider include:** Impact on ability to support Pacifica operation
Likelihood of Success	**Factors to consider include:** # of (known) risks not considered, omissions in understanding of enemy vulnerabilities, omissions in understanding of MNF vulnerabilities	**Factors to consider include:** Validity of assessment of host country objectives and response	**Factors to consider include:** Consistency with relevant ROEs and doctrine; MNF support for the COA; likelihood of COA to succeed; Number of constraints impacting success of COA; Flexibility to accommodate redirection

Figure 1-3: Factors to Consider in Applying MOEs to COA

Immediately after each vignette the participants were asked to complete a Vignette Evaluation Questionnaire that included a section dedicated to the evaluation of the COAs. Each reviewer was to rate the three sections of the COA as totally satisfactory or less than totally satisfactory in terms of completeness, accuracy and suitability. For all ratings of "less than totally satisfactory," the reviewer was to specify and weight the deficiencies.

After the completion of MN LOE I a panel of multinational senior subject matter experts was also asked to evaluate the COAs produced by the two planning teams. A summary of the graybeard evaluation process and results is provided in Section 3.

1.4.3 COI #3

"Can collaborative planning be conducted successfully in a distributed environment?

COI #3 explores the viability of conducting planning in a distributed environment. The assessment of COI #3 is based on a top level critique of the COAs produced by the planning teams (i.e., "Were the teams able to produce reasonable COAs?"), the observations of the control cell, and participant feedback provided via the "Team Working and Planning in Coalition Distributed Teams Survey" administered on the last day of the LOE.

1.5 DATA COLLECTION STRATEGY

Data from various sources were required to adequately evaluate the three COIs. The data collection strategy implemented for MN LOE I was extensive and included the efforts of observers during vignette play and significant data archival after each vignette. The data sources are detailed below:

- Planning Products: Mission Analysis products[14] and COAs generated by the two teams were archived after every vignette.
- Vignette Evaluation Questionnaires: The Vignette Evaluation Questionnaire was comprised of three sections: COA Evaluation, Process Evaluation, and LOE Evaluation. The participants completed this questionnaire after each vignette. The objective of the COA Evaluation section was to collect comments pertaining to the completeness, accuracy and suitability of the COAs developed using the Traditional and Integrated processes. The Process Evaluation section solicited comments regarding strengths and weaknesses of the processes as well as recommended improvements. The LOE Evaluation section solicited comments pertaining to LOE tools and structure.
- Player Profile Surveys: A critical aspect of post-LOE analysis was the review of the evaluation questionnaires completed by participants. The Player Profile Survey provided the analysis team with insight into the experiences (operational, training, academic, etc.) influencing the responses.
- Process Description Sheets and Control Cell Observations: Throughout the LOE members of the control cell observed the activities of the planning cells at each of the sites. When required, they interacted with the players to gather information and team leaders were routinely interviewed. Control cell members also monitored Groove spaces to track collaboration activities. Since it was anticipated that the Traditional and Integrated processes would evolve over the course of the experiment, the Process Description sheet was developed to help control cell staff track significant changes. Control cell members completed this form at the end of every vignette.
- Groove Space Tools (Threaded Discussion, Text Chat, Messages): The threaded discussion and text chat areas stored in the various shared spaces were collected to aid the analysis team in understanding the thought processes involved in developing the COAs and also reconstruct the timelines of the planning processes.
- Team Working and Planning in Coalition Distributed Teams Survey: This survey was designed to gain insight into the experiences of LOE participants working as part of a distributed international team. It included questions pertaining to interoperability and distributed team working.
- Analysis Workshop: A workshop was held approximately 1.5 months after MN LOE I during which analysts from the participant countries were able to review findings and share insights. The workshop is discussed further in Section 3.

[14] Unlike the COA, the Mission Analysis products were defined by the teams and consequently differed somewhat between the Traditional and Integrated teams.

Section 2

SUMMMARY OF MN LOE I

2.1 LOE MANAGEMENT

The LOE was managed during execution by a distributed virtual control cell that was linked via the CFBLNet. The main component of the control cell was located at the US Joint Forces Command JBC in Suffolk, Virginia. The control cell had a representative at each nation's point of participation. The control cell was responsible for the setup, execution, and data collection for each vignette. The control cell was also responsible for coordinating with CFBLNet operations staff to resolve network difficulties. Figure 2-1 depicts the distributed control cell for the LOE

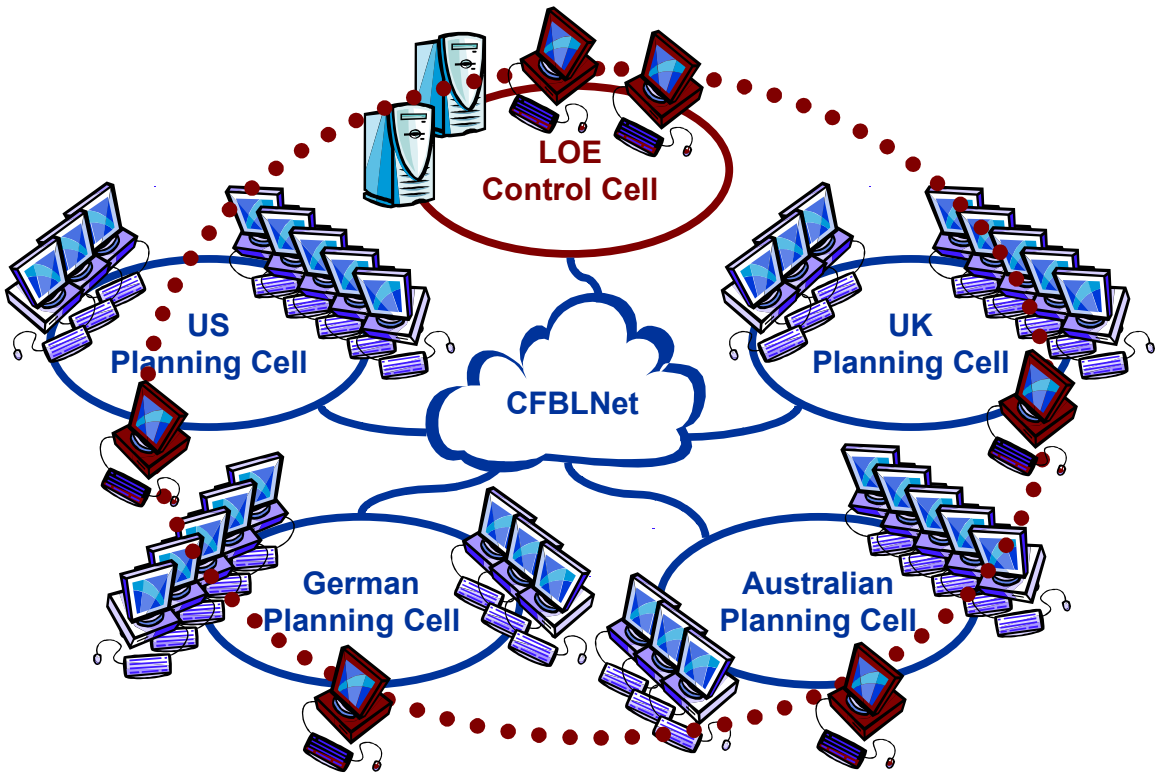


Figure 2-1: MN LOE I Distributed Management

2.2 LEAD ASSIGNMENTS AND VIGNETTES

The LOE was made up of two training vignettes followed by eight vignettes. Each vignette exercised two teams, Traditional and Integrated, concurrently. Each team was comprised of staff from each participating nation. For each vignette, each team had a lead staff

designated among the participating nations. If a national staff was designated as lead, that nation provided a staff of five individuals; otherwise, national staffs consisted of three individuals. Each traditional national staff was scheduled to lead twice during the LOE. The US staff led the integrated team during the training vignettes and the vignettes of the first week, since the US staff was most familiar with the Integrated approach. This provided the other national staffs an opportunity to observe before leading the Integrated team. Each participating nation was scheduled to lead the Integrated team once during the second week. The rotation of lead staffs was scheduled so that no nation had the lead for both teams concurrently, and therefore would not be required to provide more than eight individuals during any vignette. Figure 2-2 depicts the LOE schedule and assignments.

Staff Assignment Summary																						
	1 Nov - 2 Nov				5 Nov - 9 Nov								12 Nov - 16 Nov									
	T1		T2		V1		V2		V3		V4		V5		V6		V7		V8			
	Trad	Int	Trad	Int	Trad	Int	Trad	Int	Trad	Int	Trad	Int	Trad	Int	Trad	Int	Trad	Int	Trad	Int		
US	Contrib (3)	CJFHQ (5)	Contrib (3)	CJFHQ (5)	Contrib (3)	CJFHQ (5)	Contrib (3)	CJFHQ (5)	Contrib (3)	CJFHQ (5)	Contrib (3)	CJFHQ (5)	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)	Lead (5)	Integrated (3)	Contrib (3)	CJFHQ (5)		
UK	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)	Contrib (3)	CJFHQ (5)	Contrib (3)	Integrated (3)		
Germany	Lead (5)	Integrated (3)	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)	Contrib (3)	CJFHQ (5)	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)		
Australia	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)	Contrib (3)	CJFHQ (5)	Contrib (3)	Integrated (3)	Contrib (3)	Integrated (3)	Lead (5)	Integrated (3)		

Figure 2-2: MN LOE I Schedule

The control cell used the same Groove peer-to-peer collaboration software for coordination as did the LOE participants during the vignettes. This simplified the software configuration and permitted the control cell to observe participant collaboration during the vignette yet gave the control cell a private control space for coordination. Prior to the start of a vignette, the control cell would create all the shared spaces needed for the vignette, ensure all background and scenario information was available in the spaces, and verify that all participants had access to the shared spaces. Each national Traditional staff had a shared space for planning and it was up to the lead nation to decide how collaboration was to take place across national staffs. The Integrated team had a main shared space and three functional shared spaces for planning, intel, and logistics, which could be accessed by all members of the Integrated team from all nations. All participants had access to a scenario space that provided background information. During the vignettes, the control cell distributed scenario events, like intelligence reports, to all participants on both teams by instant text messages so there was no bias towards any team organization.

During the conduct of a vignette, the distributed members of the control cell monitored activity at their location and used the control shared-space to coordinate as necessary, usually by text or voice chat. The CFBLNet operations staff also had access to the control shared space to facilitate coordination when network problems arose. This was important since the Groove software requires connectivity to synchronize shared spaces in each Groove client, the collaboration software application that resides on the computer of each participant.

The control cell relied heavily on observations during the LOE to provide the context for participant actions and activity. The control cell members at the overseas locations coordinated with national technical staff to collect observations on survey forms that were later integrated into the LOE analysis effort. The following organizations provided observers and survey materials that contributed to the analysis:

- Defence Science & Technology Organisation (DSTO) - Fern Hill Park, Australia
- Canadian Forces Experimentation Centre (CFEC) - Ottawa, Canada
- German Joint Operations Command - Potsdam, Germany
- Defence Science & Technology Laboratory (DSTL) - Portsdown West, UK.

Figure 2-3 is a graphical representation of the Groove shared spaces used during each LOE vignette.

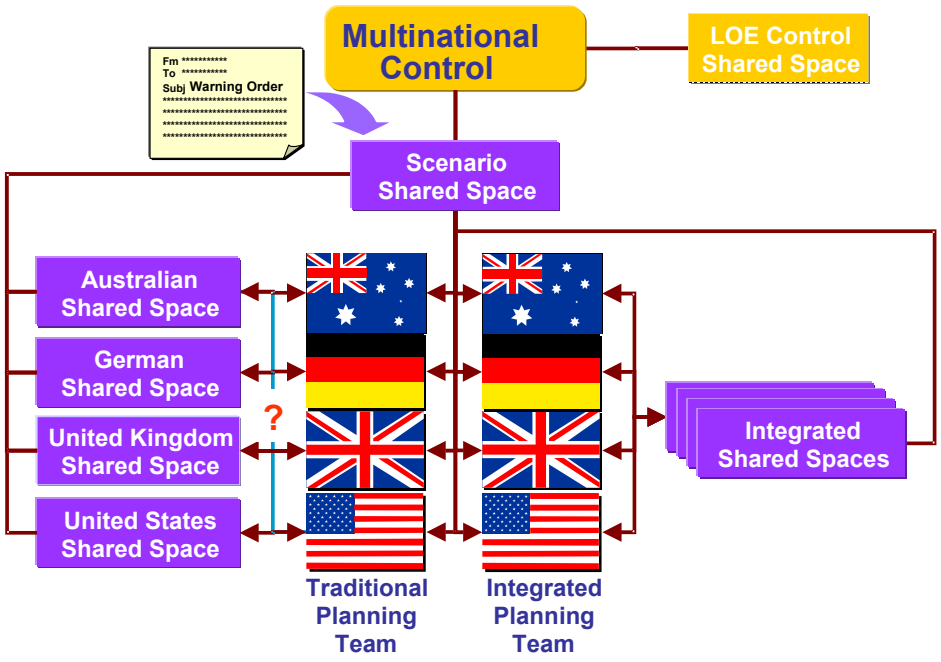


Figure 2-3: LOE Vignette Collaboration Spaces

2.3 SYSTEM PERFORMANCE

The CFBLNet permitted the MN LOE I to be conducted in a distributed global manner, allowing nations to participate from their own facilities in their country. By taking advantage of the CFBLNet and the available national facilities, a considerable savings in travel costs was possible. Having a point of participation located in each nation also facilitated the availability of national staff to participate in the MN LOE. Conducting the first LOE distributed over a global wide area network did raise the issue of risk. A big risk mitigating factor was that CFBLNet successfully supported the Joint Warrior Interoperability Demonstration (JWID) 2001 earlier in the year and substantial technical support was available in each participating nation and at critical nodes. Critical nodes included the Defense Information Systems Agency (DISA) Advanced Information Technology Services Joint Program Office (AITS-JPO) and NATO Command Control Communications Agency (NC3A). NC3A was a key node on CFBLNet for the German Point of Participation (POP) in Potsdam, which did not exist during JWID 2001. The German POP at Potsdam was linked through NC3A to the CFBLNet at Royal Air Force (RAF) Molesworth, UK.

Three stress tests with all POPs were conducted to ensure that the use of Groove over CFBLNet could support the MN LOE. Of particular concern was the German POP, which was linked to the CFBLNet by commercial Integrated Services Digital Network (ISDN) dial-up lines through NC3A. Initially, the connection to Germany had 512 Kbps of bandwidth from RAF Molesworth to NC3A and 256 Kbps from NC3A to Potsdam. However testing showed 1 Mbps from RAF Molesworth to NC3A and 512 Kbps from NC3A to Potsdam were needed to reduce latency to an acceptable level. From the US, CFBLNet provided 512 Kbps to Australia, 1.5 Mbps to Canada, and 2 Mbps to the UK.

The stress tests were also designed to determine if the Groove collaboration software would perform as advertised. The MN LOE planning team used Groove on the Internet as the planning space for the LOE with numerous participants from all participating nations with great success. Prior to MN LOE I, Groove had not been tested in an environment where up to fifty Groove clients would be synchronized concurrently over a network with single paths to the POPs.

A Groove enterprise requires a relay server to establish the presence of each Groove client. The relay server provides each client with routing information to deliver data packets known as “deltas” from one client to another, or peer-to-peer (P2P). The relay server stores deltas that cannot be immediately delivered from one client to another. The relay server holds the deltas for a period of time then delivers the deltas to the receiving client when it is available. Groove Networks provided a beta version of their Internet relay server for use on the CFBLNet during the LOE. The beta relay server was limited in that it could not forward deltas to clients who did not receive them when they were first sent. This required the sending client to send deltas again when the receiving client was available.

The three stress tests and two training vignette sessions led the MN LOE planning team to believe that Groove and the CFBLNet as configured for the LOE were sufficient to support the eight vignettes scheduled for the two-week period, 5-16 November 2001.

2.4 DATA COLLECTED

The performance of the collaboration software over a global wide area network was an experiment in itself. The LOE was designed to examine the implementation of Joint Interactive Planning (JIP) by a multinational force headquarters planning an RDO and not the technical infrastructure supporting the LOE. However, because Groove is a relatively new collaboration product built on the P2P concept, there was strong interest on the part of the participating nations in gaining further insight into the collaboration tool and distributed planning environment. For example, DSTL investigated the human factors associated with collaboration using computer software over a wide area network. DSTO surveyed the LOE participants on the use of Groove as a collaboration tool. DSTL and DSTO findings will be published separately.

The CFBLNet was generally reliable except for the link from RAF Molesworth to Potsdam, an extension to the CFBLNet put in place for the MN LOE. The link to Potsdam was made up of separate ISDN lines, each with 64 Kbps of bandwidth. For example, the link from NC3A to Potsdam consisted of eight ISDN lines. The lines were running Internet Protocol (IP) over Asynchronous Transfer Mode (ATM); overhead meant the usable bandwidth was less than 64 Kbps. There were continual problems with lines disconnecting and having to be redialed. On several occasions during LOE vignettes the link to Potsdam went completely down when commercial providers performed maintenance, usually after midnight local time.

When the German POP would go down, Groove clients at all other POPs would have to re-send deltas generated while the German POP was down. The glut of deltas severely affected throughput, especially from Australia to Germany. There was no way to purge the backlog of deltas in Groove other than to “un-invite” a client from a shared space, remove the shared space from the client, and then re-invite the client to the same space, a clumsy workaround at best. Figure 2-4 shows bandwidth used during a portion of the LOE.

The graphs in Figure 2-4 represent throughput on CFBLNet in and out of the US for two vignettes. The activity on the left of the upper band shows the loss of connectivity to Germany during a vignette with throughput between the other nations well within available bandwidth. On the right is the network activity associated with the subsequent vignette. Here network activity is normal with the exception of Australia, where Groove clients were re-sending deltas that were not previously delivered.

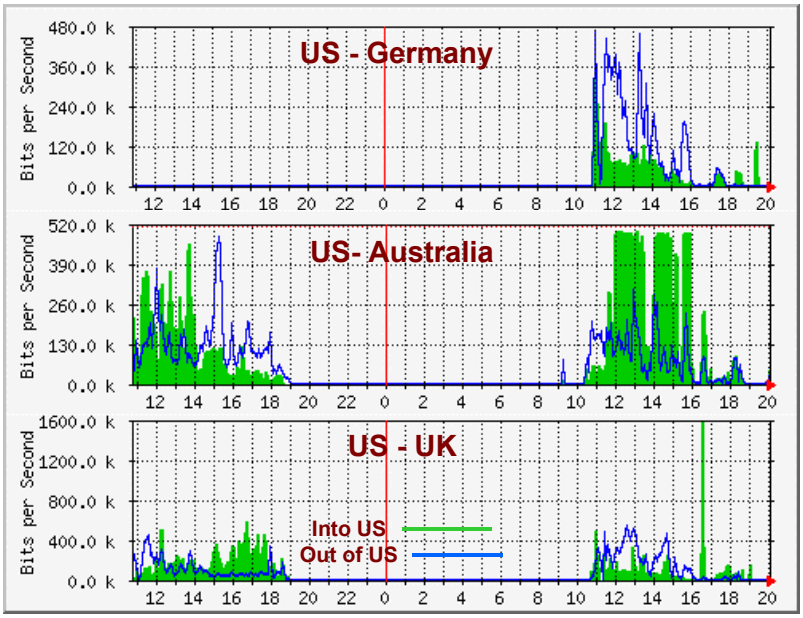


Figure 2-4: CFBLNet Performance

The use of a Network Time Protocol (NTP) is important when using Groove as a collaboration tool. Groove not only ensures that shared spaces are synchronized on all clients, it delivers the deltas in the order created. If Groove client computers clocks are not synchronized, deltas will be delivered in the order they were created. For example, if computer A shows a clock time of 8:00 and computer B shows a clock time of 8:05, any deltas created by computer A will appear in the shared space on computer B five minutes before they were created. Groove uses the delta timestamp to maintain chronological order. This ordering is most notable in text chat and can be confusing, especially if users are exchanging questions and answers. For the LOE, different clock synchronization solutions were used. German and UK computers were synchronized to an Internet site providing Greenwich Mean Time (GMT). Australian computers were synchronized to a router at the JBC set to GMT. The latter worked well until the JBC router lost power and reverted to a time that set Australian computer clocks back seven hours. When the router was reset back to GMT, Australian Groove clients began re-sending seven hours of deltas. An important lesson learned is that computer clock synchronization is critical in a distributed collaboration environment.

In the final analysis, when CFBLNet was stable, Groove performed well. Voice chat, the feature most susceptible to bandwidth, had low latency even between Australia and Germany, the path with the least bandwidth and the most "hops" as shown in the Figure 2-5.

Figure 2-5: CFBLNet Bandwidth for MN LOE I

Figure 2-6 depicts the overall reliability of the CFBLNet during the LOE. The only recurring problems were with the ISDN dial-up lines between RAF Molesworth, NC3A, and Potsdam. Other problems over the course of the LOE were a JBC power failure that took down a router, ATM multi-point signaling and crypto sync problems at NC3A, and an intermittent Open Shortest Path First (OSPF) routing problem in the US. AITS-JPO and NC3A technical staff worked quickly to resolve problems when they arose. The link to Potsdam was clearly a case of what was feasible within the time available. The use of leased commercial dial-up lines was the only available solution. A more permanent solution is needed if the German POP is to remain in Potsdam.

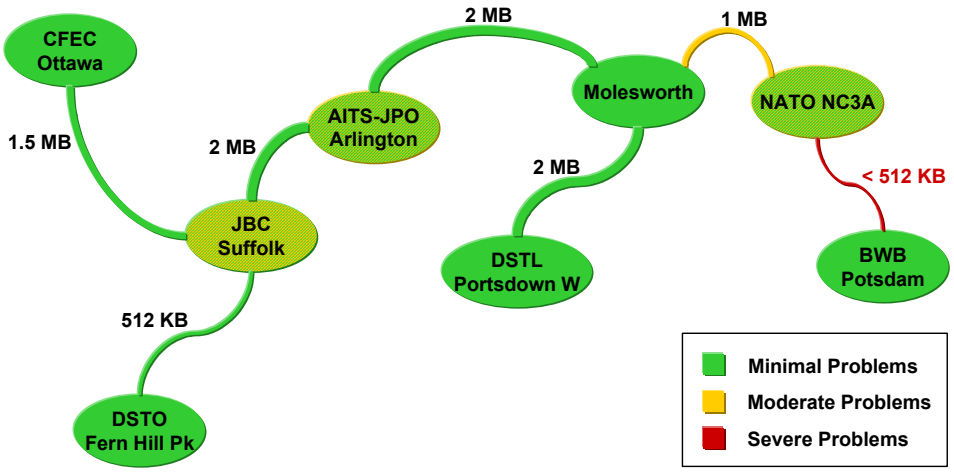


Figure 2-6: MN LOE I Network Reliability

MN LOE I was the first multinational effort of the USJFCOM Joint Futures Lab. It was unique since it was a focused discovery experiment structured to examine a specific aspect of the RDO concept, namely distributed planning with multinational partners. The LOE was also a pilot event in that it attempted a global distributed experiment linking sites that had never been linked using a relatively new collaboration tool and approach. MN LOE I also took an innovative approach for controlling the experiment by relying on a distributed virtual control cell in lieu of the more traditional centralized approach. Finally, MN LOE I served as a venue for focused research on topics of national interest. Follow-on LOEs will benefit from the management insights gained during MN LOE I.

Intentionally Left Blank

Section 3

ANALYSIS RESULTS

3.1 INTRODUCTION

The data collected during MN LOE I were both massive and diverse. They consisted of control cell observations, participant responses to several surveys, and various planning materials stored in the collaboration tool. The primary objective of post-LOE analysis activities was to compile and correlate the diverse data sources in order to address the three COIs specified for MN LOE I:

COI #1: With the introduction of the collaborative tool, did the Traditional and Integrated planning processes evolve into similar processes [from the perspective of multinational collaboration] or were they different?

Given the complex nature of the planning processes, the study of processes addressed a set of common characteristics: Organizational Structure, Use of Tool, Schedule of Events, Role of Lead Nation, Impact of Lead Nation on Process, Effectiveness of Inter-Country Interactions, Effectiveness of Intra-Country Interactions, and Balance in Skills/ Experience/Background of Team Members. These characteristics will be addressed in the discussion of COI #1.

COI #2: Assuming both processes are equipped with the same collaboration capability, does the quality of the COAs (completeness, accuracy and suitability) produced by the Traditional and Integrated planning processes differ as a function of length of planning window and type of operation?

COI #3: Can collaborative planning be conducted successfully in a distributed environment?

The Johns Hopkins University Applied Physics Laboratory (JHU/APL) analysis team reviewed the raw data collected during the LOE and generated preliminary findings to support evaluation of the COIs. Table 3-1 lists the data sources used to evaluate each of the three COIs. Preliminary findings were reviewed with analysts from J9, SACLANT (NATO), UK, Germany, and Canada during the MN LOE I Analysis Workshop conducted at JHU/APL January 9-10, 2002. Inputs from the multinational analysts have been incorporated into this report. In particular, the analysts attending the workshop participated in voting exercises developed to answer the questions posed in COI #1 and COI #3.

Table 3-1

Data Sources Used to Evaluate MN LOE I COIs

COI	DATA SOURCE				
	Control Cell Observations	Vignette Evaluation Surveys	Planning Materials (e.g., Text Chat)	Distributed Team Work Survey	Graybeard COA Evaluations
COI # 1: With the introduction of the collaborative tool, did the Traditional and Integrated planning processes evolve into similar processes [from the perspective of multinational collaboration] or were they different?					
Organizational Structure	X		X		
Use of Tool[15]	X	X			
Schedule of Events	X		X		
Role of Lead Nation		X	X	X	
Impact of Lead Nation on Process		X	X	X	
Effectiveness of Inter-Country Interactions		X	X	X	
Effectiveness of Intra-Country Interactions		X	X	X	
Balance in S/E/B of Team Members	X	X			
COI # 2: Assuming both processes are equipped with the same collaboration capability (i.e., Groove), does the quality (*completeness, accuracy, suitability*) of the COAs produced by the Traditional and Integrated planning processes differ as a function of length of planning window and type of operation					X
COI #3: Can collaborative planning be conducted successfully in a distributed environment?	X	X	X	X	X

[15] The Military Systems Experimentation Branch of the Australian Defense Science and Technology Office (DSTO) administered a detailed technology survey that focused on Groove. Analysis of this survey will be done by DSTO. When the DSTO results are available, the key findings from this study will be correlated with tool-related findings included in this report.

The three COIs are discussed in detail in the following sections.

3.2 SUMMARY OF KEY FINDINGS

The key findings compiled during MN LOE I analysis are summarized below; the rationale and supporting discussion are detailed in the sections that follow.

3.2.1 COI #1

"With the introduction of the collaborative tool, did the Traditional and Integrated planning processes evolve into similar processes [from the perspective of multinational collaboration] or were they different?"

The Traditional team took advantage of the collaboration tool and the Traditional process followed in MN LOE I was more integrated in nature than the conventional 'stove-piped' approach typically associated with the Lead Nation concept. Further investigation is required to assess whether, given the availability of a robust collaboration environment and a commonly defined process, the Traditional process might naturally evolve into something similar to the Integrated process.

The Traditional and Integrated processes followed in MN LOE I demonstrated significant similarities and differences, and consequently a definitive comparison of the two processes proved to be challenging. The processes did exhibit noteworthy differences in the areas of leadership and situational awareness. Issues related to leadership have potential implications for doctrine, procedures and training. The infrastructure implications related to maintaining continuous situational awareness of team activity merits further study. System and network performance data collected during MN LOE I should provide very useful insignts.

By design, planning during MN LOE I was primarily conducted at the operational level. It would be of interest to examine the adaptation of the Integrated process to the tactical level (i.e., more detailed, real-time planning).

Key findings for each of the eight process characteristics are provided below:

Organizational Structure

Both planning teams used the All Hands model for review activity.

During the first week of the LOE the Traditional team primarily used the National Cell approach for development and completion. During the second week the team experimented with the Functional and All Hands models for these planning activities. Throughout the LOE the multinational members of the Traditional team interacted during all planning activities, largely due to the fact that they elected to share a common Groove space.

Overall, the Integrated team followed the strategy laid out in the LOE training materials, which made extensive use of the Functional Cell and All Hands models. The consistency of the Integrated approach was due in large part to fact that the United States was assigned the lead for four of the seven vignettes. There appeared to be a greater emphasis on following a constant approach vice experimenting and refining the Standard Operating Procedure.

Use of Tool

Both planning teams elected to use a common Groove space for core planning activities. The Traditional cells, however, also used physical whiteboards whereas the Integrated team conducted all work in the Groove shared spaces.

Both planning teams used the full suite of Groove tools, though they did exhibit differences in how they used the tools. The most significant difference between the two teams was in their use of audio, with the Integrated team demonstrating a greater use of audio. Also, control cell observers noted that the Traditional teams experimented more with Groove tools than did the Integrated team. The Integrated team appeared to adhere to the Groove business rules promulgated at the beginning of the LOE in order to replicate the same process for each vignette.

For a variety of reasons neither team relied heavily on BrainEKP and Autonomy. Both teams expressed significant satisfaction with Groove and an interest in using the collaboration tool in a real operation.

Schedule of Events

The Traditional and Integrated planning teams followed a similar schedule of events during their respective planning cycles. The Integrated team did spend more time on MA development (on average), while the Traditional team spent more time on COA development (on average). Given that time was not specified as a measure of effectiveness (MOE) for the planning processes, little more should be inferred into the above observations other than the Integrated process appears to place a greater emphasis on MA development as compared to the Traditional process.

Role of Lead Nation

The processes followed by the teams during the LOE appeared to embody different perspectives regarding the role of the lead country. In the Traditional process “lead country” was synonymous with “leader;” and throughout the LOE, team members examined and reflected on the topic of leadership. By comparison, in the Integrated process the lead country operated more as a manager than a traditional Lead Nation. There also was an implicit assumption that any planning activity conducted by the lead country should be visible to the entire team.

Impact of Lead Nation on Process

Differences in training and lead assignments resulted in the Integrated team following a process that was notably more stable than that of their Traditional counterparts. The impact of doctrinal and cultural preferences was more pronounced in the Traditional team; doctrinal differences were often cited in the feedback provided by the Traditional team.

Effectiveness of Inter-Country Interaction

During each vignette both teams successfully generated a COA, sometimes in the face of significant network problems. The Integrated team, more than the Traditional team, indicated that technical problems at times degraded the effectiveness of their process, primarily because maintaining situational awareness of team activities is critical to the Integrated process. By contrast, some members of the Traditional team indicated that at times there was too much data exchange among team members.

The teams did not provide a strong indication whether the distributed environment made it more difficult to develop and maintain situational awareness or anticipate the needs of fellow members. Likewise, few participants indicated that it was more difficult to "reach consensus over decisions in a distributed team".

Effectiveness of Intra-Country Interaction

For both processes members of the national cell communicated with each other primarily using face-to-face communications vice the collaboration tool.

Balance of Skills/Experience/Background of Team Members

Both planning teams indicated they lacked logistics expertise. The US Integrated team was unique in that some members had worked together for almost a year while most of the other cells were working together for the first time during MN LOE I.

3.2.2 COI #2

> *"Assuming both processes are equipped with the same collaboration capability, does the quality of the COAs (completeness, accuracy and suitability) produced by the Traditional and Integrated planning processes differ as a function of length of planning window and type of operation?*

Overall, the graybeards marginally preferred the COAs produced by the Integrated team, citing completeness as a critical factor. Given the small size of the graybeard panel (five), statistical significance cannot be assigned to most of the individual vignette scores. Two exceptions are Vignettes E and H, where a significant majority of the experts selected the

COAs produced by the Integrated team.

The analysis of the graybeard evaluations did not produce a definitive explanation of the factors(s) causing the graybeards to prefer the Integrated COAs. The examination of the types of operations and lengths of planning window represented in the seven vignettes did not suggest an overall trend that would readily explain the graybeard selections. A workshop participant suggested that the "Integrated team was better at coming up with a COA given the restricted (low intensity) operations." This is an interesting observation that requires further study.

Another factor that merits further examination is the fact that the Integrated team followed a process for which they recently received training and that was played consistently throughout the experiment. Overall, this may have allowed the Integrated team to better retain corporate knowledge and leverage off previous planning efforts.

3.2.3 COI #3

"Can collaborative planning be conducted successfully in a distributed environment?"

MN LOE I did demonstrate that collaborative planning can be conducted in a distributed environment. Even with this positive result, the potential adverse impact of poor system and network performance on the planning processes should not be ignored nor minimized. Additional study is required to specify the system requirements associated with supporting distributed planning, especially at the level represented in the Integrated process. By design the exchange of classified data was not addressed in MN LOE I, but will need to be explored in future LOEs.

3.3 DETAILED DISCUSSION OF COI #1

"With the introduction of the collaborative tool, did the Traditional and Integrated planning processes evolve into similar processes [from the perspective of multinational collaboration] or were they different?"

3.3.1 ORGANIZATIONAL STRUCTURE

For each of the seven vignettes played during LOE I, the two planning teams established an organizational structure that determined how participants operated during MA and COA development, review, and completion. The country designated as the lead for a given vignette determined the organizational structure. For this reason, the structures varied somewhat vignette to vignette. Overall, three basic models for planning interactions were observed during the LOE:

- **National Cell:** When a given planning activity (i.e., development, review, or completion) followed the national cell approach, the initial effort for the activity was conducted within the country cell before the planning product was disseminated (i.e., made "visible") to the coalition partners. National cells operated either as a contributing country or the lead.
- **Functional Cell:** When a given planning activity followed the functional cell approach, cells comprised of multinational planners were established to address specific functional areas such as plans, intelligence and logistics.[16] In some cases a multinational "Tiger Team" was assigned the responsibility for producing an initial product. In another variation on the functional cell concept, countries were assigned the role of a Component Commander (i.e., Air, Land, Maritime, and Special Operations Forces).
- **All Hands:** In the case of "all hands" interaction, the entire team interacted during a planning activity, almost as independent agents. In almost all cases, both teams adopted the "all hands" approach for MA and COA review.

To characterize how the organizational strategies selected by the two teams varied over the course of the LOE, a pictorial technique that visually captures differences and trends was developed. This technique is demonstrated in the pre-LOE characterizations of the Traditional and Integrated planning organizational structures depicted in Figure 3-1. The organizational structures used during each planning phase (MA development, review, and completion; COA development, review, and completion) are depicted. Horizontal bars correspond to structures aligned with the National Cell model, whereas vertical bars represent structures aligned with the Functional Cell models. The diagonal bar represents the All Hands model. The organizational structure used by a team during a given planning phase is highlighted in yellow.

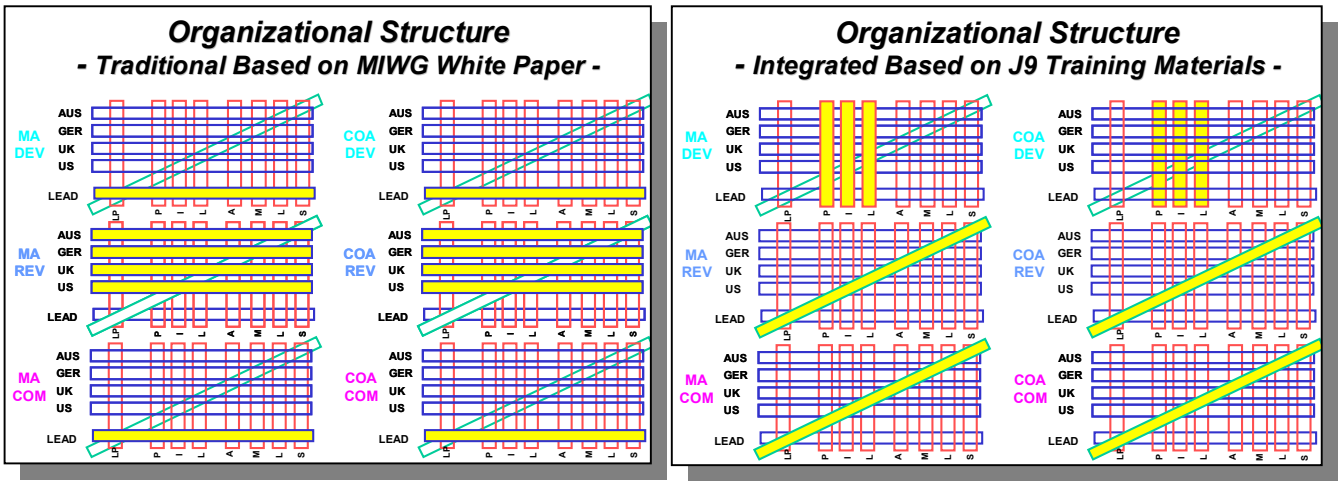


Figure 3-1: Pre-LOE Characterizations of Traditional and Integrated Planning Team Organizational Structures

[16] Logistics was identified as a critical functional area. However, given LOE staffing choices, the logistics analysis performed during the LOE focused almost exclusively on force requirements. Both the Traditional and Integrated teams indicated that they lacked personnel with a strong logistics background.

Based on the Multinational Interoperability Working Group (MIWG) white paper on the Lead Nation concept, it was envisioned that the Traditional planning team would use the "National Cell" approach almost exclusively. Training materials provided by the Integrated team prior to the LOE indicated that their strategy would rely heavily on the Functional Cell and All Hands models. The organizational structures observed during the seven vignettes of MN LOE I are documented in Appendix B.

As previously noted, both teams used the All Hands approach for almost all review activity. Also, the structures of both teams varied over the course of the LOE depending on the direction provided by the "lead" country.

Key Findings

Both planning teams used the All Hands model for review activity.

During the first week of the LOE the Traditional team primarily used the National Cell approach for development and completion. During the second week the team experimented with the Functional and All Hands models for these planning activities. Throughout the LOE the multinational members of the Traditional team interacted during all planning activities, largely due to the fact that they elected to share a common Groove space.

Overall, the Integrated team followed the strategy laid out in the LOE training materials, which made extensive use of the Functional Cell and All Hands models. The consistency of the Integrated approach was due in large part to the fact that the US was assigned the lead for four of the seven vignettes. There appeared to be a greater emphasis on following a constant approach vice experimenting and refining the Standard Operating Procedure.

3.3.2 USE OF TOOL

Both teams conducted planning using Groove. A summary of the usage levels (H=high, M=medium, L=low/none) of the different tools available via Groove is provided in Figure 3-2.

	Use of (1) Groove Spaces		Use of Tools						
	Common	Private	Audio	Agenda	Text Chat	Threaded Discussion	Messages (2)	Whiteboard	Notepad
TRADITIONAL TEAM	H	L	L	L	H	M	L	H	H
INTEGRATED TEAM	H	L	H	L	H	L	L	M	H

1. Both teams used common spaces almost exclusively (vice working in their own National spaces), and so both teams had the *capability* to provide input during MA and COA development and review, and maintain situational awareness of other countries' inputs. The *actual level of collaboration* was determined by how the lead nation elected to implement the planning process during a given vignette.
2. Difficult to assess; messages only stored on individual workstations.

Figure 3-2: Use of Groove for Coalition Team Interaction

Prior to the LOE it was expected that the Traditional process would utilize private (i.e., country) shared spaces for national cell planning whereas the Integrated team would operate primarily from a common Integrated Planning space. What occurred during the LOE is that from the outset both teams elected to use a common Groove space for core planning work.[17] In the case of the Traditional team the decision to use a single space was largely a response to unreliable network performance. Control cell observers noted, however, that while the national cells did not use their private Groove spaces each Traditional cell did utilize a physical whiteboard that served as a virtual planning space for the national cell. By contrast the Integrated team did not use white boards and almost all work was conducted in the shared spaces, thus allowing all team members to have up-to-date situational awareness of planning activities. From the perspective of observers, control cell staff found the single space strategy of the Traditional team easier to track than the multiple space approach adopted by the Integrated team. Concern was raised about the possible implications for hand-off when planning personnel or 'lead' country are re-assigned. Feedback provided by members of the Integrated team, however, indicates that participants actively involved in the process did not appear to have problems tracking planning activities.

[17] Functional cells established within the Integrated team did use special purpose shared spaces for Plans, Intel and Logistics.

The Traditional and Integrated teams used the Agenda, Messaging, Text Chat and Notepad tools at about the same level. The two planning teams differed significantly, however, in their use of audio during planning. The Integrated team considered audio to be critical to their planning process[18] and used it throughout the LOE. The Traditional team decided early on to minimize their use of audio, primarily because of connectivity problems but also because they felt text chat minimized confusion among multinational partners. Team views regarding the impact of audio on their planning process are summarized in Figure 3-3.[19]

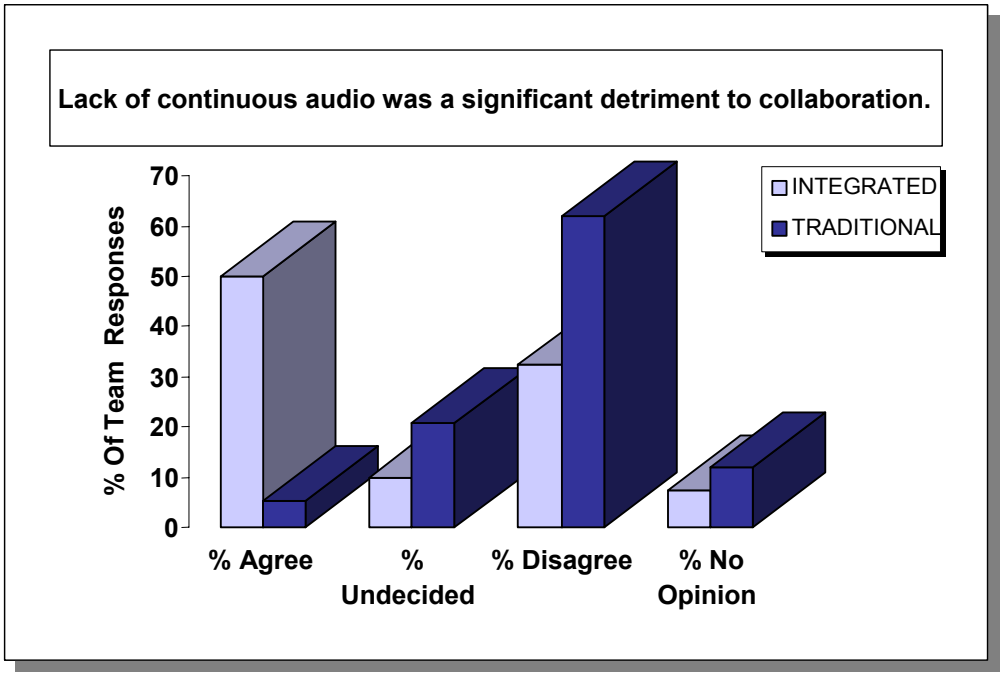


Figure 3-3: Vignette Evaluation Question 1: "Lack of Continuous Audio Was a Significant Detriment to Collaboration."

The teams also differed in their use of the Threaded Discussion and Whiteboard tools, with the Traditional teams demonstrating greater and more optimal use of these tools. Both teams used the Threaded Discussion tool to manage Requests for Information (RFIs), but the Traditional team also used this tool to effectively share products and conduct reviews. Control cell observers noted that the Traditional teams experimented more with Groove tools than did the Integrated team over the course of the LOE resulting in greater efficiency in their use of certain tools. A factor to be considered, however, is that the Integrated team attempted to replicate the same process during each vignette and therefore may have elected to follow the Groove business rules promulgated at the beginning of the LOE.

[18] Though the majority of the Integrated team held this view, there were some members who disagreed. Country responses to this question and participant comments regarding the use of audio are provided in Appendix C.

[19] These data were collected from the Vignette Evaluation Questionnaires completed after each vignette. Figure 2-4 reflects summary totals for the entire LOE. Breakdowns by week and country are provided in Appendix C.

As noted earlier, the planning teams were also equipped with BrainEKP and Autonomy to support open source information (OSI) research for intelligence purposes. In lieu of a true Operational Net Assessment for the geographic areas specified in the vignettes, BrainEKP was intended to provide limited Intelligence Preparation of the Battlespace (IPB). The feedback collected from the participants suggests that these tools were not used very much during the LOE. Survey statements postulating that BrainEKP/Autonomy "supported the planning process in a satisfactory manner" yielded a significant number of "Undecided" and "Not Applicable" responses, indicating that many participants had not used the tools enough to be able to agree or disagree with the survey statements.[20] This conclusion is confirmed by the observations of control cell staff stationed at the national sites. Lack of formal training prior to the LOE and unavailability of the tools due to network problems were cited as potential reasons why the participants did not use the tools more. Control cell observers also noted that early on some participants found the URLs loaded into the tools to be irrelevant to the problem at hand, and therefore elected to henceforth ignore the tools and query the www directly.

Key Findings

In summary, both planning teams elected to use a common Groove spaces for core planning activities. The Traditional cells, however, also used physical whiteboards whereas the Integrated team conducted all work in the Groove shared spaces.

Both planning teams used the full suite of Groove of tools, though they did exhibit differences in how they used the tools. The most significant difference between the two teams was in their use of audio, with the Integrated team demonstrating greater use of audio. Also, control cell observers noted that the Traditional teams experimented more with Groove tools than did the Integrated team. The Integrated team appeared to adhere to the Groove business rules promulgated at the beginning of the LOE in order to replicate the same process each vignette

For a variety of reasons neither team relied heavily on BrainEKP and Autonomy. Both teams expressed significant satisfaction with Groove and an interest in using the collaboration tool in a real operation.[21] (See Figure 3-4.)

[20] Tool evaluation data compiled from the Vignette Evaluation Questionnaires is provided in Appendix C.

[21] These data was collected from the Vignette Evaluation Questionnaires completed after each vignette. Additional details pertaining to this data are provided in Appendix C.

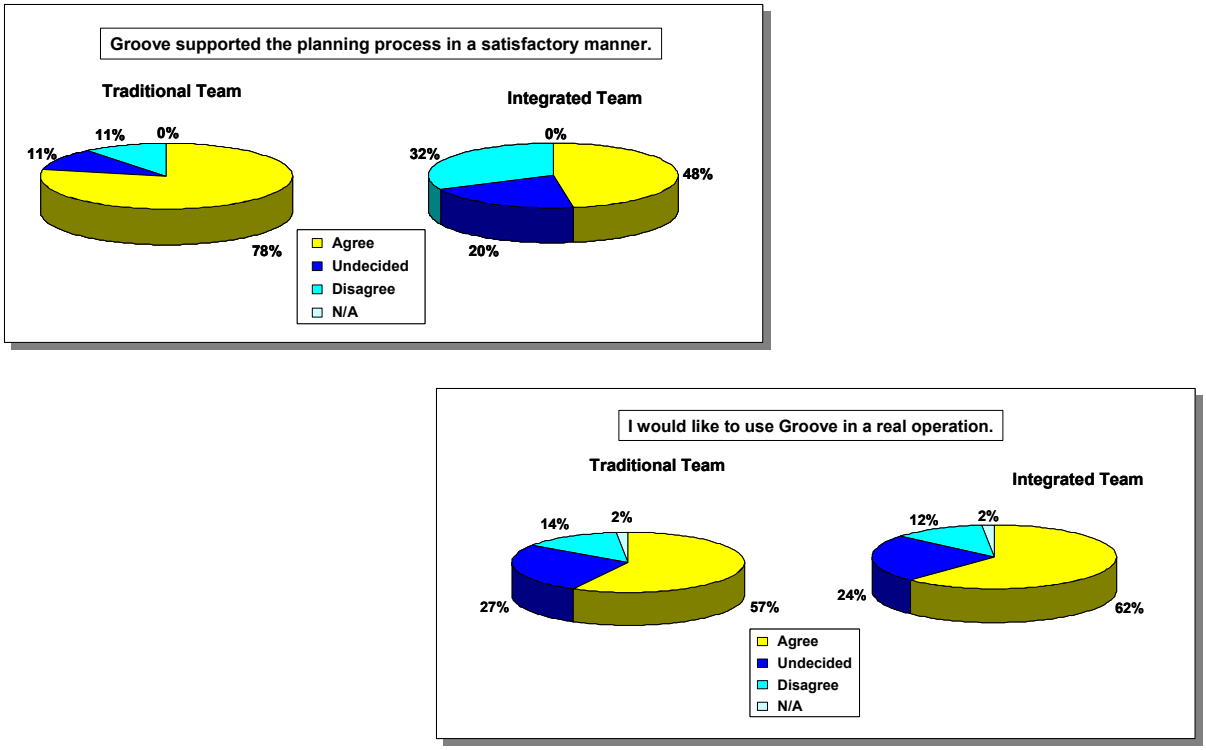


Figure 3-4: Groove Evaluation Questions - Vignette Evaluation Questionnaire

3.3.3 SCHEDULE OF EVENTS

Both planning teams followed a planning cycle that included development, review, and completion of MA products and a COA. Table 3-2 details the start and end times of these planning activities for each of the seven vignettes. The two teams followed basically the same planning agenda, though there were some differences in the respective planning timelines, as summarized in Figure 3-5.

Table 3-2

Planning Timelines

Vignette ID (Start Time, End Time) DECRIPTION Designated Timeline	Timelines (All Times in Zulu)			
	Traditional Process		Integrated Process	
	Mission Analysis	Course of Action	Mission Analysis	Course of Action
C (1200Z, 1800Z) TYPHOON VIETNAM MA:1500, COA:1800	UK 1204 Started 1332 Review started 1423 Completed	UK 1425 Started 1700 Review started 1750 Completed	US 1200 Started 1445 Review started 1522 Completed	UK 1528 Started 1732 Review started 1745 Completed
E (1200Z, 1800Z) PIRACY MA:1500, COA:1800	GE 1205 Started 1340 Review started 1411 Completed	GE 1418 Started 1613 Review started 1655 Completed	US 1200 Started 1340 Review started 1449 Completed	AUS 1510 Started 1708 Review started 1806Z Completed
F (1000Z, 2000Z) HOSTAGE CRUISE LINER MA: 1500Z, COA: 2000Z	UK 1000 Started 1127 Review started 1245 Completed	UK 1236 Started 1701 Review started 1913 Completed	US 1000 Started 1340 Review started 1500 Completed	US 1508 Started 1602 Review started 1930 Completed
G (2200Z, 0400Z) NEO-INDONESIA MA: 0130Z, COA: 0400	GE 2200 Started 0009 Review started 0105 Completed	GE ~0105 Started 0253 Review started 0355 Completed	AUS 2200 Started 2340 Review started 0130 Completed	AUS 0153 Started 0330 Review started 0414 Completed
H (2200Z, 0400Z)[1] PROTECTION OF SHIPPING- PIRACY MA: 0200Z, COA: 0600Z	US 2212 Started 2342 Review started 0033 Completed	US 0039 Started 0337 Review started 0445 Completed	GE 2200 Started 2330 Draft/Review 0109Completed	UK 0130 Started 0334 Draft/Review 0512 Completed
I (2300Z, 0700Z)[2] DISASTER RELIEF PNG MA:0300, COA:0700	US 2307 Started 0100 Review started 0220 Completed	US 0237 Started 0504 Review started 0538 Completed	UK 2300 Started 0115 Draft/Review 0153Completed	UK 0214 Started 0315 Review Started 0512 Completed
J (0230Z, 0800Z)[3] PIRACY: MV WEN ZHO MA: 0500Z, COA: 0800Z	AU 0230 Started 0324 Review started 0410 Completed	AU 0357 Started 0523 Review started 0652 Completed	US 0230 Started 0340 Review started 0520 Completed	AUS 0525 Started 0628 Review started 0737 Completed

[1] Vignette H - Lost Germany approximately 0114Z. UK took the lead at 0141Z.
[2] Vignette I- Germany lost connectivity ~ 0354Z.
[3] Vignette J- Germany lost connectivity - all night.

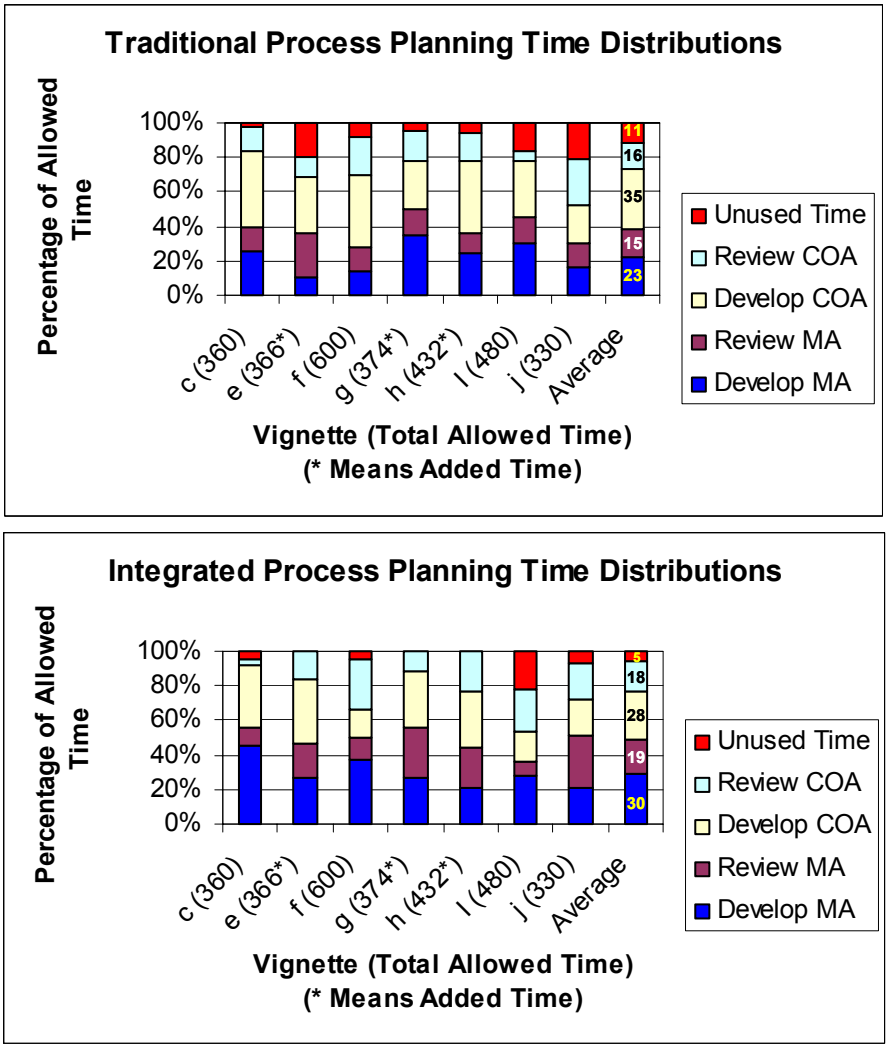


Figure 3-5: Planning Time Distributions for Traditional and Integrated Teams

In Figure 3-5, the time for "Develop MA" represents the time from the start of the vignette to the indicated completion of the draft MA. The "Review MA' represents the time from the completion of that draft MA to the completion of its review. Since typically only a few minutes lapsed before the development of the COA was begun, the time period for "Develop COA" is measured from the completion of the MA Review to the completion of the draft COA. Similarly, "COA Review" is measured from this point to the point that the COA is finished and sent to SACAPAC. In several cases for the Integrated team (specifically Vignettes F and I), it was difficult to ascertain exactly when the COA draft was finished and its review was started. In particular, in Vignette F, it appears that pieces of the COA were finished and under review while other portions of the COA were still in development. The mid-point of that process was used as the dividing line for this figure. In some cases, the COA was finished and delivered to SACAPAC before the end of the

planned time for the vignette. This excess, unused time, is shown as red. In three cases, Vignettes E, G, and H, the Integrated Team took slightly longer than the original time planned for the vignette. This time overrun is considered an informal extension of the vignette duration and shown here as "added time," indicated by an asterisk.

Before considering findings based on the time distributions depicted in Figure 3-5, it is prudent to recognize extenuating factors that may have impacted the realized planning time distributions.

- "Dead Time": Unused time, as defined above, does not include the periods when the network was down for at least one of the countries. These "dead" periods are included in the planning time distributions. As noted, during some vignettes Germany had minimal or no connectivity. Also, control cell observers noted that at times participants in contributing countries were relatively inactive while awaiting guidance from the lead country.
- Similar Vignettes: Control cell staff observed that because some vignettes posed similar situations, there were cases when participants leveraged off work that had been performed during an earlier vignette (in particular during the MA phase). This observation applies primarily to the Traditional team.
- Lead Hand-Off: Because of network problems, there were occasions when the lead assignment had to be transferred to another country.

Examining the planning time distributions for MA and COA efforts reveals that there are some differences between the teams in the times allocated to tasks but no clear trends are noted through the experiment for changes in those times. It is the case that both teams spent on average 58% of the planning time on development. On average, the Integrated team spent more time on MA development than did the Traditional team (30% vice 23%) while the converse is true for COA development (Traditional 35%; Integrated 28%). Discussions with US participants revealed that spending more time on MA was viewed as contributing to a better COA product and actually an integral part of the Integrated strategy. Typically, a preset time interval was allocated for MA development and in most cases the entire interval was used. On the other hand, the operational tempo of MA development for the Traditional team was driven more by the expertise and initiative of the contributing countries.

Key Findings

The Traditional and Integrated planning teams followed a similar schedule of events during their respective planning cycles. The Integrated team did spend more time on MA development (on average), while the Traditional team spent more time on COA development (on average). Given that time was not specified as an MOE for the planning processes, little more should be inferred into the above observations other than the Integrated process appears to place a greater emphasis on MA development as compared to the Traditional process.

3.3.4 ROLE OF LEAD NATION

During each vignette a "lead" country was designated for both the Traditional and the Integrated teams. The processes followed by the teams during the LOE appeared to embody different perspectives regarding the role of the lead country. In the Traditional process "lead country" was synonymous with "leader" and throughout the LOE team members examined and reflected on the topic of leadership.[22] As previously noted, lead countries often had the *primary* role during MA and COA development. In one instance a Traditional team member noted that the "…(Lead Nation) went into a nation huddle for COA development, but that tends to be the way of the traditional planning process…." Some participants indicated that the lead country should not "…give out too much of its own responsibility to coalition partners."

By comparison, in the Integrated process the lead country operated more as a manager than a traditional Lead Nation. When the US operated as the lead, they employed the functional cell approach in order to integrate the activities of the multinational partners during development activities. There also was an implicit assumption that any planning activity conducted by the lead country should be visible to the entire team.

As interesting as these observations are, however, one must be cautious about inferring too much about the Integrated process and the underlying RDO concept. Several very important factors need to be considered:

- COA development represents a window of a larger planning cycle. The definition of that larger planning process under the RDO concept is still under development.
- The structure of the LOE did not include an intermediate command level between the planning cells and SACAPAC. Based on conversations with members of the US Integrated team, final decisions regarding the plan would be made at the next higher level. The role of the planning cell was to provide recommendations to that commander and not necessarily make "command decisions."
- Several participants noted that the LOE design did not include political advisors who would provide national guidance and inject national priorities. Lacking this potentially limiting factor, members of the planning cells operated almost as independent agents. This was considered to be an artifact of the experiment and operationally unrealistic.

Key Findings

The processes followed by the teams during the LOE appeared to embody different perspectives regarding the role of the lead country. In the Traditional process "lead country" was synonymous with "leader" and throughout the LOE team members examined and reflected on the topic of leadership. By comparison, in the Integrated process the lead country operated more as a manager than a traditional Lead Nation. There also was an implicit assumption that any planning activity conducted by the lead country should be visible to the entire team.

[22] Based on feedback compiled from Section II of Vignette Evaluation Questionnaire.

3.3.5 IMPACT OF LEAD NATION ON PROCESS

Upon the request of the multinational participants, the US cell served as the lead for the Integrated team for the entire first week of the LOE and once again during the final vignette. In addition, the US cell developed the training materials and business rules that provided common guidance for the multinational team members. By contrast, training materials were not developed for the Traditional process since it was assumed that all of the coalition countries had an understanding of how to operate under the Lead Nation concept. The lead assignment for the Traditional process was rotated through the four countries so that, barring technical problems, each country would serve twice as lead.

These differences in training and lead assignments resulted in the Integrated team following a process that was notably more stable than that of their Traditional counterparts. The impact of doctrinal and cultural preferences were more pronounced in the Traditional team as evidenced by the fact that doctrinal differences was often cited in the feedback provided by the Traditional team.[23] A participant of the Analysis workshop offered this observation: "National staff training and processes vary; these may be reflected more in the Traditional analysis. The consequence of developing an integrated MN staff process would be the need to create a common training process across all nations. This would have national and inter-service cultural implications." It is the case that the Traditional team refined its process over the course of the LOE and developed a Standard Operating Procedure that incorporated a combination of the practices introduced by the different lead countries.

Key Findings

Differences in training and lead assignments resulted in the Integrated team following a process that was notably more stable than that of their Traditional counterparts. The impact of doctrinal and cultural preferences was more pronounced in the Traditional team; doctrinal differences were often cited in the feedback provided by the Traditional team.

3.3.6 EFFECTIVENESS OF INTER-COUNTRY INTERACTION

As discussed earlier, the two planning teams exhibited differences in pre-LOE training, organizational structure, expectations regarding the lead country, and their use of Groove tools. Nevertheless, for each vignette both teams successfully generated a COA, sometimes in the face of significant network problems. It is the case that the Integrated team, more than the Traditional team, indicated that technical problems at times degraded the effectiveness of their process.[24] Team members noted that "degradation of (communications) reduced (the) ability to plan interactively" and "without it (*the collaboration tool*) the collaboration breaks down and momentum is lost." The planning then becomes "highly traditional in nature."

[23] Based on comments compiled from responses to Section II of Vignette Evaluation Questionnaire.
[24] Based on comments compiled from Section II of Vignette Evaluation Questionnaire.

Comments from the Integrated team regarding the impact of network problems reflect the underlying assumption that maintaining situational awareness of team activities is critical to the Integrated process. "Integrated planning relies on saturation of all communications media for parallel and concurrent efforts."[25] By contrast, some members of the Traditional team indicated that at times there was too much data exchange among team members.[26] "In the Traditional process a lot of work goes on in the background as the lead nation develops the COA."[27]

Another dimension of inter-country interaction is the effectiveness of teams working and planning in a distributed environment. As reflected in the summary results depicted in Figure 3-6, both teams indicated that the distributed environment hampered their planning process to some degree.[28] Yet when asked whether the distributed environment made it more difficult to develop and maintain situational awareness or anticipate the needs of fellow members[29], the responses of both teams reflected ambivalence and significant disagreement. Few participants indicated that it was more difficult to "reach consensus over decisions in a distributed team" (see Figure 3-7).

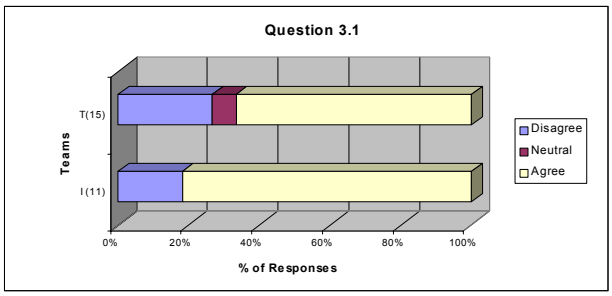
[25] Comment provided in Section II Vignette Evaluation Questionnaire.

[26] Sample comments include:
"Continuous data feed provided by GROOVE from unrecognizable sources seriously hampered the intended data flow."
"The immense amount of information given by so many experts can hamper own consideration flow once in a while. Too many opinions are not always helpful."

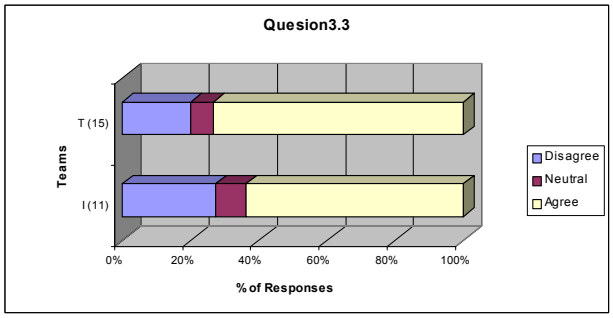
[27] Source: Team Working and Planning in Coalition Distributed Teams Survey, response to Question 3.1.

[28] These results are based on responses collected for the Team Working and Planning in Coalition Distributed Teams Survey administered at the end MN LOE I. The UK analysis team developed the Coalition Distributed Teams Survey as a part of their human factors studies conducted during MN LOE I. The UK has the lead for the analysis of this survey. The JHU/APL analysis team compiled summary results in order to correlate findings from this survey with observations collected from other data sources. Summary charts for the 13 questions contained in the survey are provided in Appendix D.

[29] Summary results for Questions 3.5 and 3.6, the Team Working and Planning in Coalition Distributed Teams Survey, are provided in Appendix D.



Q 3.1 : Monitoring each other's actions as a distributed team was more difficult than monitoring each other's actions in a co-located team.



Q 3.3 : It was more difficult for distributed team members to identify when other team members needed assistance, in comparison to co-located team members.

Figure 3-6: Team Working and Planning in Coalition Distributed Teams Survey: Questions 3.1 and 3.3

Question 3.8 : It was more difficult to reach consensus over decisions in a distributed team.

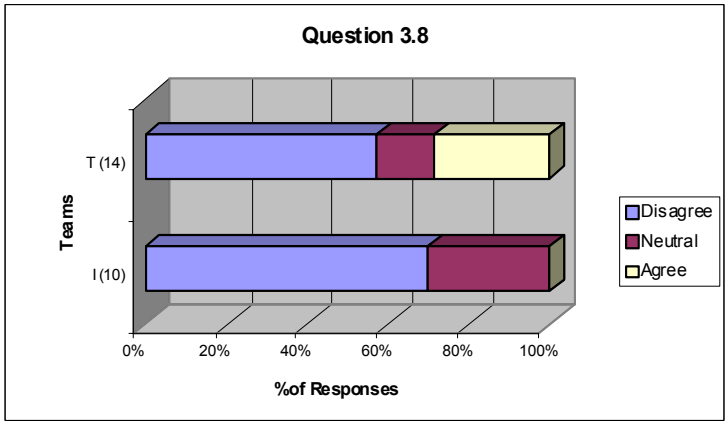


Figure 3-7: Team Working and Planning in Coalition Distributed Teams Survey: Question 3.8

Key Findings

During each vignette both teams successfully generated a COA, sometimes in the face of significant network problems. The Integrated team, more than the Traditional team, indicated that technical problems at times degraded the effectiveness of their process, primarily because maintaining situational awareness of team activities is critical to the Integrated process. By contrast, some members of the Traditional team indicated that at times there was too much data exchange among team members.

The teams did not provide a strong indication the distributed environment made it more difficult to develop and maintain situational awareness or anticipate the needs of fellow members. Few participants indicated that it was more difficult to "reach consensus over decisions in a distributed team."

3.3.7 EFFECTIVENESS OF INTRA-COUNTRY INTERACTION

For both processes members of the national cell communicated with each other primarily using face-to-face communications vice the collaboration tool. The US Integrated cell attempted to capture national cell information exchanges in Groove but even in their case a significant amount of interaction was conducted directly person-to-person.

Key Findings

For both processes members of the national cell communicated with each other primarily using face-to-face communications vice the collaboration tool.

3.3.8 BALANCE OF SKILLS/EXPERIENCE/BACKGROUND OF TEAM MEMBERS

During post-LOE discussions some control cell observers commented that there was disparity in the skills, experience and background of the two planning teams. When surveyed during the Analysis Workshop, however, observers either found it difficult to make a knowledgeable evaluation of this criterion or disagreed as to whether the teams differed on this point. It is the case that both planning teams indicated they lacked logistics expertise. Also, the US Integrated team was unique in that some members had worked together for almost a year while most of the other cells were working together for the first time during MN LOE I.

Key Findings

Both planning teams indicated they lacked logistics expertise. Also, the US Integrated team was unique in that some members had worked together for almost a year while most of the other cells were working together for the first time during MN LOE I.

3.3.9 ANALYSIS WORKSHOP ASSESSMENT OF PROCESS CHARACTERISTICS AND SUMMARY COMMENTS

In preparation for the MN LOE I Analysis Workshop, the JHU/APL analysis team carefully reviewed the extensive data compiled for the eight characteristics defining the Integrated and Traditional planning processes. Developing a definitive response to COI #1 was a challenge since the two processes exhibited both similarities and differences. Responding to COI #1 proved to be a challenge for the participants of the workshop as well. Nine participants (including two members of the JHU/APL team) rated each of the characteristics as an indicator that the processes were similar or different. Summary results are provided in Appendix E. The nine participants demonstrated consensus on three of the eight characteristics: role of lead, impact of lead, and inter-country interaction. The two processes were assessed as being different on the first two points and similar on the third. Workshop participants disagreed on the remaining five points.

In summary, the comparison of the two planning processes suggests that the following topics require further consideration.

- The Traditional team took advantage of the collaboration tool and the Traditional process played in MN LOE I was more integrated in nature than the conventional 'stove-piped' approach typically associated with the Lead Nation concept. Further investigation is required to assess whether given the availability of a robust collaboration environment and a commonly defined process, the Traditional process might naturally evolve into something similar to the Integrated process.
- The Traditional and Integrated processes followed in MN LOE I demonstrated significant similarities and differences, and consequently a definitive comparison of the two processes proved to be challenging. The two processes did exhibit noteworthy differences in the areas of leadership and situational awareness. Issues related to leadership have potential implications for doctrine, procedures and training. The infrastructure implications related to maintaining continuous situational awareness of team activity merits further study. System and network performance data collected during MN LOE I should provide good insight.
- By design, planning during MN LOE I was primarily conducted at the operational level. It would be of interest to examine the adaptation of the Integrated process to the tactical level (i.e., more detailed, real-time planning).

3.4 DETAILED DISCUSSION OF COI #2

"Assuming both processes are equipped with the same collaboration capability, does the quality of the COAs (completeness, accuracy and suitability) produced by the Traditional and Integrated planning processes differ as a function of length of planning window and type of operation?

The examination of COI #1 supports the conclusion that the two planning processes demonstrated in MN LOE I had similarities as well as some significant differences. COI #2 explores whether the noted differences resulted in one of the processes consistently

producing a better COA. The strategy developed to conduct this assessment was to have LOE participants and senior subject matter experts, referred to as 'graybeards', critique both COAs for each of the seven vignettes. The participants and graybeards would evaluate the COA in terms of three MOEs: completeness, accuracy and suitability.

After the first vignette LOE participants indicated that they were not able to properly critique the COA produced by the other team due to time limitations. They did provide valuable feedback about the COAs produced by their own team. This development meant that the analysis team was not able to use the participants' COA evaluations to conduct a comparative assessment of the two processes. Consequently, the examination of COI #2 would rely on the feedback provided by the graybeard panel.

Within a month after the LOE, the graybeard panel was provided a package of materials that included scenario and vignette information, Mission Analysis products, Requests for Information and Courses of Actions for each of the seven vignettes. The panel was comprised of five senior experts from Australia (2), Germany (1) and United States (2). The planning products were labeled as "Team A" and "Team B," Traditional and Integrated, respectively. The graybeards were then asked to conduct a "blind review" using a common evaluation questionnaire (provided in Appendix F). The panel was not provided indicators as to the process or lead country that generated a given COA.

Summary results of the graybeard evaluation are provided in Figures 3-8 and 3-9. Given the fact that the graybeard panel consisted of only five experts, one should be cautious when assigning statistical significance to most of the individual vignette scores. Two exceptions are Vignettes E and H, where a significant majority of the experts selected the COAs produced by the Integrated team. The strategy for evaluating the COAs included the compilation of the total number of deficiencies identified for the three MOEs (completeness, accuracy and suitability), with the assumption that the COA with the least number of deficiencies would be considered better. Though the graybeard reviewers provided comments explaining their selections, they did not identify deficiencies at a level that would allow the analysis team to generate a tally for comparative purposes. They did indicate that completeness was a critical consideration in their selections.

	Vignettes Played / Reviewed						
Reviewers	C	E	F	G	H	I	J
1	B	Eq	A	B	B	Eq	Eq
2	A	B	B	B	B	B	A
3	A	B	A	A	B	B	A
4	B	B	B	A	B	A	B
5	B	B	B	B	B	B	B

Figure 3-8: Summary of Senior Subject Matter Expert (Graybeard) COA Evaluations

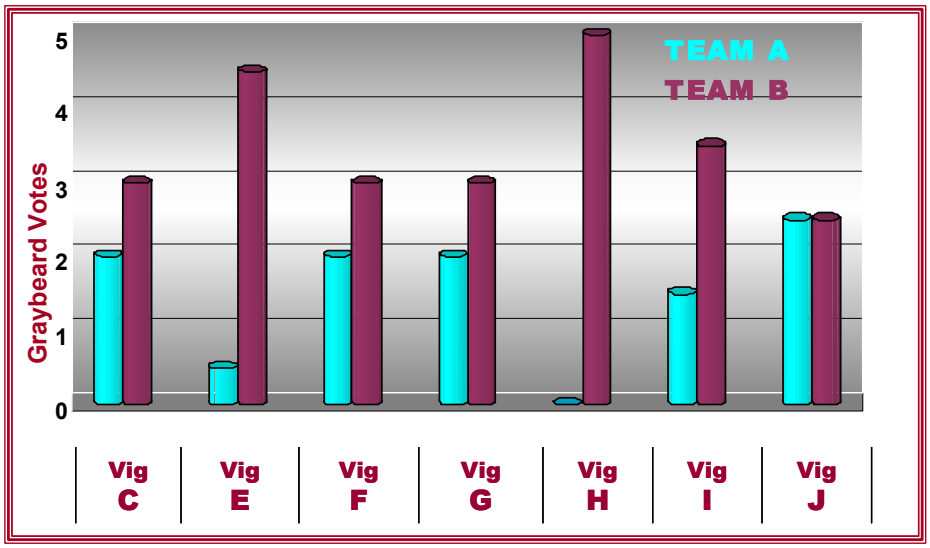


Figure 3-9: Summary of Graybeard Selections

Both planning teams developed a COA for Vignettes C through J. Each of the reviewers (1 through 5) was asked to indicate if they preferred one of the two COAs (Traditional = "A," Integrated = "B"), or otherwise rate them as equal ("Eq").

In the case of Vignettes E, J, and I, a reviewer rated the two COAs as comparable, i.e., 'Eq." Both teams were assigned a half-vote for these vignettes.

The following points summarize the graybeard feedback:

- In several instances the experts noted little difference/preference between the two COAs though when asked to indicate a preference they selected "Team B."
- They suggested that the commander would send even the preferred COAs back to the planners for more work on specifics.
- In some cases the experts recommended that elements of the COA not selected should be incorporated in next version of the selected COA.
- The experts noted equivalent deficiencies/problems in both COAs.
- The final selections were based primarily on completeness. Suitability was rarely discussed and accuracy was apparently considered adequate since few specific errors were noted.

The participants of the Analysis Workshop reviewed the graybeard results to identify the reason(s) why the graybeard panel expressed an overall preference for the COAs produced by the Integrated team. Type of operation and length of planning window were considered; a summary of these characteristics for the seven vignettes is provided in Table 3-3. As previously stated, all the vignettes were based on MOOTW vice warfighting situations. One participant of the analysis workshop conjectured that "the vignettes were reasonably similar and

therefore the integrated team was better at coming up with a COA given the restricted (low intensity) operations."[30] Other than this general observation, an examination of the seven vignettes does not suggest an overall trend that would readily explain the graybeard selections. Both Vignettes E and H were six hours in length and addressed piracy situations. However, the Integrated process was rated better for both short (6 hours) and longer (9 hours) vignettes. Also, for Vignette J, another piracy operation, the COAs yielded similar ratings for the two teams.

Table 3-3

Summary of MN LOE I Vignettes

Vignette	Duration of Vignette (hrs)	Operation	Description
C	6	Humanitarian Assistance	Typhoon; Vietnam
E	6	Protection of Shipping; Counter piracy	Merchant ship flagged to one of the coalition members; Malacca Straits
F	10	Recovery Operations; Counter Piracy	Hostage situation on cruise ship; Semarang, Indonesia
G	6	Noncombatant Evacuation Operations	Citizens of coalition countries; Ache Province, Indonesia
H	6	Protection of Shipping; Counterrorism, Counter piracy	Japanese ship carrying radioactive materials, terrorist threat
I	8	Humanitarian Assistance	Cyclone; Papua New Guinea
J	9	Recovery Operations; Counter piracy	MV WEN ZHO seized; Bikini Atoll, Marshall Islands

Another possible explanation unrelated to the actual vignettes is that the Integrated team was able to better retain corporate knowledge and leverage off previous planning efforts: " …(1) the US led most of the time, so the other countries learned the style early on and could then spend proportionally more time working on MA/COA development and (2) the Traditional team had more dead time within the experimental timeline, so the Integrated Team had a higher level of manpower actively working the problem…. Could be a combination of both of these, and other factors was well."[31] Yet another suggestion: "…did the Integrated team receive more positive votes due to the COA development as a team versus the Traditional approach which restricted input, or rather filtered it through the lead nation?"[32]

[30] Appendix E: MN LOE I Analysis Workshop
[31] ibid
[32] ibid

Key Findings

Overall, the graybeards marginally preferred the COAs produced by the Integrated team, citing completeness as a critical factor. Given the small size of the graybeard panel (five), statistical significance cannot be assigned to most of the individual vignette scores. Two exceptions are Vignettes E and H, where a significant majority (4.5 and 5, respectively) of the experts selected the COAs produced by the Integrated team.

The analysis of the graybeard evaluations did not produce a definitive explanation of the factors(s) causing the graybeards to prefer the Integrated COAs. The examination of the types of operations and lengths of planning window represented in the seven vignettes did not suggest an overall trend that would readily explain the graybeard selections. A workshop participant suggested that the "Integrated team was better at coming up with a COA given the restricted (low intensity) operations." This is an interesting observation that requires further study.

Another factor that merits further examination is the fact that the Integrated team followed a process for which they recently received training and that was played consistently throughout the experiment. Overall, this may have allowed the Integrated team to better retain corporate knowledge and leverage off previous planning efforts.

3.5 DETAILED DISCUSSION OF COI #3

"Can collaborative planning be conducted successfully in a distributed environment?"

Following the in-depth analysis conducted to address COI #1 and COI#2, it is clear that the MN LOE I did demonstrate that collaborative planning can be conducted in a distributed environment. First of all, both teams were able to successfully develop a COA for each vignette, sometimes in spite of significant technical problems. The comments provided in the Vignette Evaluation Questionnaires support the statement that the LOE participants were able to persevere and successfully conduct planning. Some of the participants indicated that by the end of the LOE the planning processes, especially the Integrated process, were working well. As previously cited, the participants indicated in their responses to the distributed teams survey that they were able to maintain situational awareness and work successfully with team members who were not co-located. Also, the participants responded that a distributed environment did not pose a significant obstacle to achieving consensus.

When polled during the Analysis Workshop as to whether MN LOE I demonstrated that collaborative planning can be conducted successfully in a distributed environment, the attendees overwhelmingly responded in the affirmative.[33]

[33] Data from the Analysis Workshop are provided in Appendix E.

Even with these positive results, the potential adverse impact of computer system problems and network congestion on the planning processes should not be ignored nor minimized. Additional study is required to specify the system requirements associated with supporting distributed planning, especially at the level represented in the Integrated process. The network problems experienced during MN LOE I adversely impacted both planning processes, though it is very difficult to assess to what degree, except in the case of Germany who for the most part was excluded from participation due to poor network performance. Of special interest are the requirements associated with maintaining continuous situational awareness of planning team activity.

Another critical component of planning is the exchange of classified data. By design this was not addressed in MN LOE I but will need to be explored in future LOEs.

Section 4

RECOMMENDATIONS

4.1 INTRODUCTION

The feedback collected from participants and observers of MN LOE I and the attendees of the Analysis Workshop provided the analysis team with many valuable recommendations for improving future LOEs.

4.2 LOE PARTICIPANT RECOMMENDATIONS

The participants of MN LOE I had many opportunities to provide feedback and offer recommendations for improving the LOE process. The participants completed Vignette Evaluation Questionnaires after each vignette and the Team Working and Planning in Coalition Distributed Teams Survey at the end of the LOE. The comments of the participants pertaining to experiment structure and design and the Groove application are summarized below. Relevant comments added by the JHU/APL analysis team are highlighted in italics.

4.2.1 EXPERIMENT DESIGN AND STRUCTURE

LOE participants offered the following recommendations pertaining to experiment design and structure:

- A robust network and better stress testing of the system prior to the experiment are critical to successful LOEs.
- Vignettes must be sufficiently challenging.
  - Participants expected updates to the operational situation would be provided at the beginning of each vignette. *Also, permutations to the vignettes during play added a lot of realism.*
  - Participants indicated that pre-LOE scenario training materials should be better aligned with the situations played during the LOE. The need for unclassified vignettes necessitated the selection of sites outside the core Pacifica military operation while the scenario materials provided in the training package focused on the Pacifica situation.
  - Participants indicated a strong preference for warfighting situations. *An issue that requires immediate investigation is whether this preference can be accommodated in an unclassified environment or whether future LOEs will need to be conducted in a classified environment. This point is addressed again in Sections 4.3 and 4.4.*
- Intelligence Preparation of Battlespace must be adequate to support vignette play.
  - This point is related to broader issues pertaining to Operational Net Assessment (ONA). The players expected that a well-developed ONA would be available at the

start of play.[34] Participants also noted that the research tools (BrainEKP and Autonomy) were not adequately initialized to serve as viable ONA. *Development of a realistic ONA for use in follow-on LOEs requires the commitment of significant resources during LOE development.*

- More training is required to adequately prepare the participants for using the tools, surveys and processes.
- LOE Command and Control structure should incorporate critical real world elements such as political advisors.[35]
- A higher level of activity on the part of the white cell is necessary.
  - Participants cited the need for greater consistency in the guidance provided by the white cell as well a higher level of interaction during play. *Meeting these requests would likely require increasing the number of personnel assigned to the LOE Commander's (e.g., SACAPAC in MN LOE I) staff.*

4.2.2 GROOVE ENHANCEMENTS

The LOE participants offered specific recommendations regarding enhancements to Groove:

- Improve the word-processing capabilities of the Groove tools (e.g. include spell check capability).
- Improve the capabilities and performance of the whiteboard.
- Improve Notepad to better support interactive, collaborative development activities. Control of the scroll feature was especially noted as a desirable feature.
- Improve messaging by adding email-like features. In particular participants wanted to know everyone who was included on the distribution of a given message.
- Incorporate a print capability into the Groove tools.
- Provide better means of archiving data from Groove and initializing shared spaces.

4.3 ANALYSIS WORKSHOP RECOMMENDATIONS

The MN LOE I Analysis Workshop was held at JHU/APL with attendees from J9, UK, Canada and Germany. The attendees of the workshop concurred with the recommendations of the LOE participants and offered the following additional recommendations:

- Many attendees felt strongly that future MN LOEs should include political advisers.

[34] The following represents a typical comment on this matter: "The information provided in the Warning Order is only sufficient if the vignette is supported with solid, prepared information. If this is not provided, the planning team must do one before the MA."

[35] The following represents a typical comment on this matter: "In reality, the domestic political considerations have far greater influence and these factors are what makes multi-national planning very difficult. The only way to simulate this is for a local exercise controller to require a participant to act in a certain way during the shaping of a COA."

  - This recommendation precipitated comments from other attendees that the inclusion of political advisors and other real world elements may greatly expand the scope of the *limited* objective experiments.
- Several attendees indicated that LOEs need vignettes that are "complex, warfighting and classified".
- A specific point made regarding the ONA was that LOE participants should be provided a common set of maps compiled specifically for each vignette.
- It was suggested that a separate Groove space be established for sharing lessons learned regarding Groove operations during vignette play.
- LOE surveys should be approved prior to the start of the LOE and data collection efforts should be integrated into a single survey. A web-based user interface would help to ensure the integrity of the data collected.
- Disparity in skill and experience levels across the international teams should be eliminated. The method to do this needs to be addressed during LOE planning, when the LOE staffing requirements are established.
- Capability requirements for collaboration tools should be investigated more in the upcoming LOEs.
- Each LOE needs an Information Manager who will monitor network and system performance and oversee system initialization prior to vignette play and data archival activities.
- The LOE white cell should include a Flag level commander who would provide guidance and feedback.
  - The presence of this commander would serve to 'raise the bar' on the performance expected from participants.
- There was considerable debate as to whether the two-process structure (Traditional and Integrated) should be maintained in follow-on MN LOEs.
  - The point was made that in order for JFCOM to get buy-in from multinational partners for migrating to new operational concepts, it is critical to establish an irrefutable case and this can be done by continuing to compare traditional concepts against new concepts in the MN LOEs.
- Establish an LOE Analysis Working Group that would "incorporate analysis from (all) countries" and coordinate activities during the planning and analysis phases of the LOE.
- The role of observers during LOEs is critical; the control cell should be appropriately staffed with observers.

4.4 JHU/APL RECOMMENDATIONS

Overall, the JHU/APL team endorses the recommendations provided by the LOE participants and attendees of the Analysis Workshop. Further discussion on some of these points and additional recommendations are provided below:

Areas Requiring Further Investigation

- Several topics worthy of additional investigation were identified during the analysis of MN LOE I. It is recommended that J9 consider exploring the following:
  - Given the availability of a robust collaboration environment and a commonly defined process, might the Traditional process naturally evolve into something similar to the Integrated process and if not, what are the major obstacles? In particular, the role of the lead nation as a leader needs to be further explored in the Integrated process.
  - What are the infrastructure implications associated with maintaining continuous situational awareness of team activity as demonstrated in the Integrated process?

Planning for Future MN LOEs

- A planning roadmap for Olympic Challenge'04 would aid in ensuring that the objectives of the individual LOEs support the larger objectives defined for Olympic Challenge '04.
- It also of paramount importance to start planning for the LOEs as soon as possible, even if the level of effort during the initial stages is minimal. An early start is necessary to ensure that critical issues and concerns are addressed early in the process, thus increasing the potential for successful resolution.

LOE Structure

- J9 should retain the distributed environment in future LOEs.
- J9 should take under serious consideration the recommendation to retain the 2-process structure (new vs. conventional) in future LOEs. The MN LOEs are critical to examining and demonstrating the value and viability of proposed RDO concepts. If a comparison of new concepts against more 'traditional' concepts is not part of the LOE structure, then a comparative assessment will need to be obtained through some other means.
- The JHU/APL analysis team agrees that keeping participants actively engaged at a challenging operational tempo is important to successful LOEs.
- The MN LOE I experience demonstrated that more complex vignettes, with continuous updates to the operational situation, should be incorporated into future LOEs. We strongly endorse the recommendation that a Flag Level commander be included in the white cell in the interest of 'raising the bar' for the participants.
- Access to classified data and challenging vignettes are two related yet separate issues. MN LOE I participants indicated the desire for more challenging vignettes and, as stated above, this request needs to be addressed. Whether this translates into war fighting, classified vignettes needs to be examined and not taken as an 'a priori' assumption. On a separate point, multinational partners have indicated a desire to move the LOEs into the classified environment, believing that this is more representative of the operational

environment in which the RDO concepts will be practiced. This request also needs to be addressed.
- LOE procedures should be formalized and publicized to all participants. This is related to the need for more extensive and common training. A workshop participant suggested that a training video would be helpful.
- The concepts being examined in the LOE series need to be established early in the planning process. Otherwise, the experiment design may not be aligned with the Critical Operational Issues that need to be examined.

Role of Multinational Partners

- J9 should encourage the multinational partners to play a more active role in scenario development and experiment design.

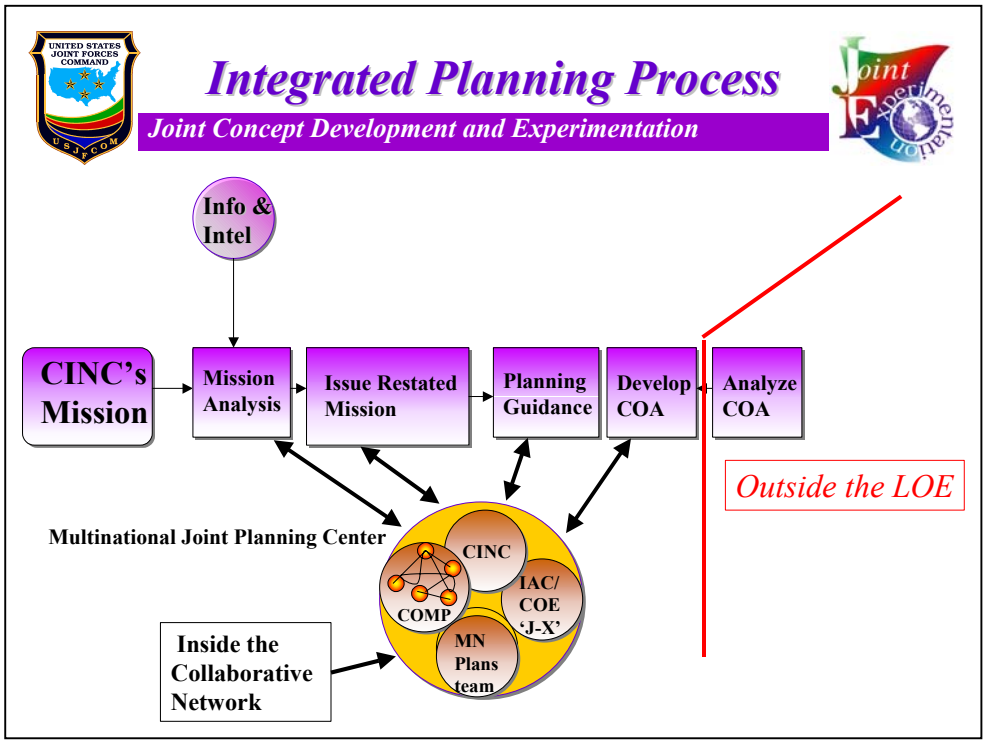
Staffing Requirements

- A designated LOE Information Manager and a sufficient staff of observers are critical to the smooth conduct of LOEs. The overall analysis strategy should incorporate observer activities.
- A design/analysis working group should be established early in the planning phase and the LOE management team should form a steering group that includes representation from the scenario and design/analysis working groups. This structure will facilitate the coordination of parallel yet potentially separate planning efforts.

Intentionally Left Blank

APPENDIX A

Excerpt from J9 "*SJC2E Briefings for MN LOE I Trainers*"

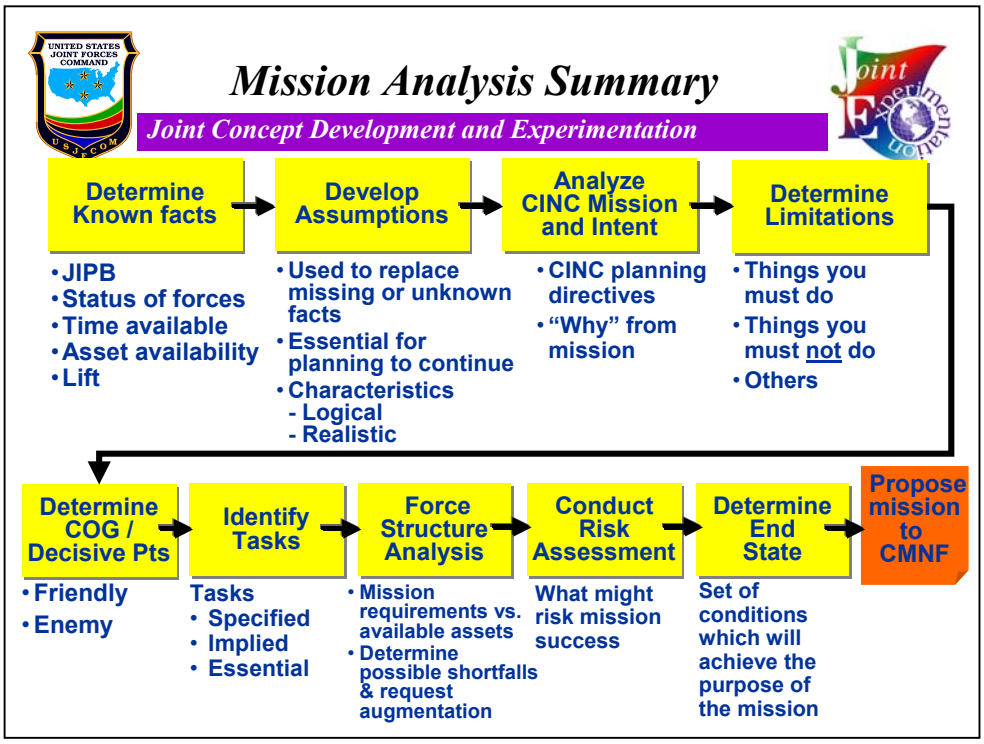


Collaboration:

The need to operate inside an adversary's decision cycle will require that the SJC2E assist in executing a more simultaneous, collaborative planning and execution process. The need for unity of effort to ensure the application of ***decisive effects*** when and where needed requires superior shared battlespace understanding, awareness of the current situation, and a common understanding of the commander's intent. One of the main functions of the SJC2E prior to the crisis, and the MNF during the crisis, is to ensure full integration of MNF with IAC and non-government capabilities across all domains. Using USJFCOM J9's Joint Interactive Planning (JIP) process, the MNF and component planning cells execute distributed, collaborative, parallel planning with higher headquarters and other key governmental agencies. Collaboration provides the means to achieve the integration required of RDO.

Information technology will provide tools for COA development and analysis that will shorten planning times and allow dynamic, continuous plan modification during execution. These same tools will support realistic mission rehearsal and training. Commanders will use collaboration tools to confer with other commanders, their distributed staffs, and SME's for planning and battle management.

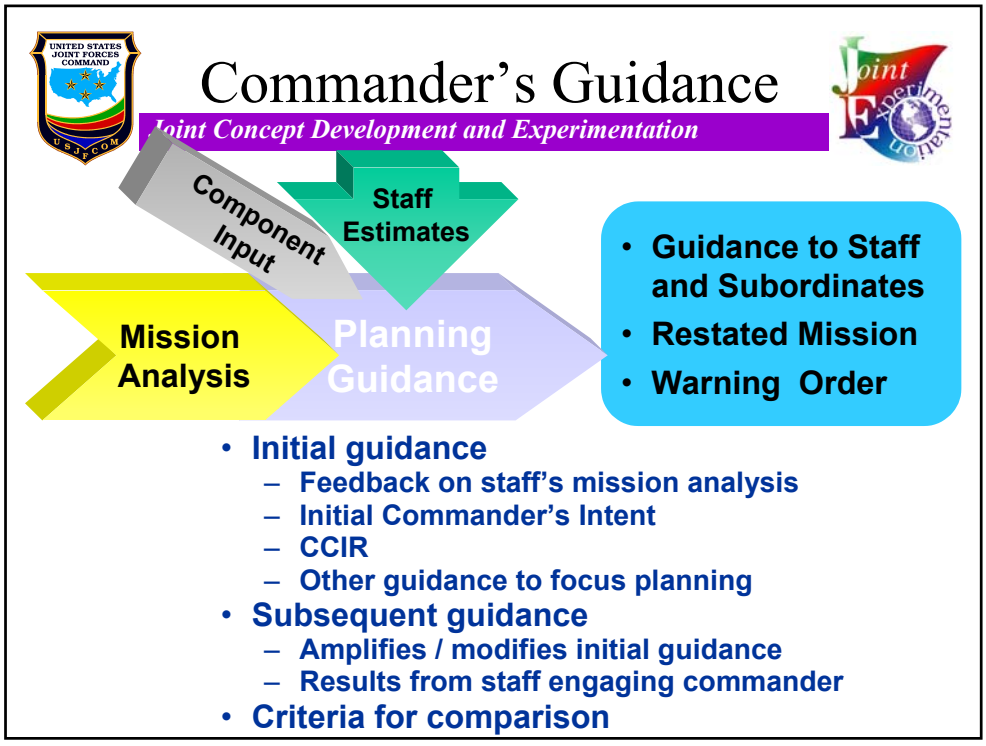
The integrated nature of future operations requires a MNF headquarters designed around mission-tailored collaborative networks. These virtual, collaborative networks include not only permanent members of the MNF staff but also representatives from supporting agencies.



- Mission analysis **should be continuous**. As the situation changes so may certain aspects of the mission. **Revisit what you've done when major events have occurred.**

- **Review your Facts! CINC Assumptions are facts for MNFs during planning unless otherwise answered.**
- **Assumptions** can be an important source of your initial RFIs.
- **Share JIPB with components!**
- **End states**: **Consider** strategic, **establish** operational, **give guidance** on tactical.

- **Products from this phase are: Approved MSN Statement and CDRs Planning Guidance**.



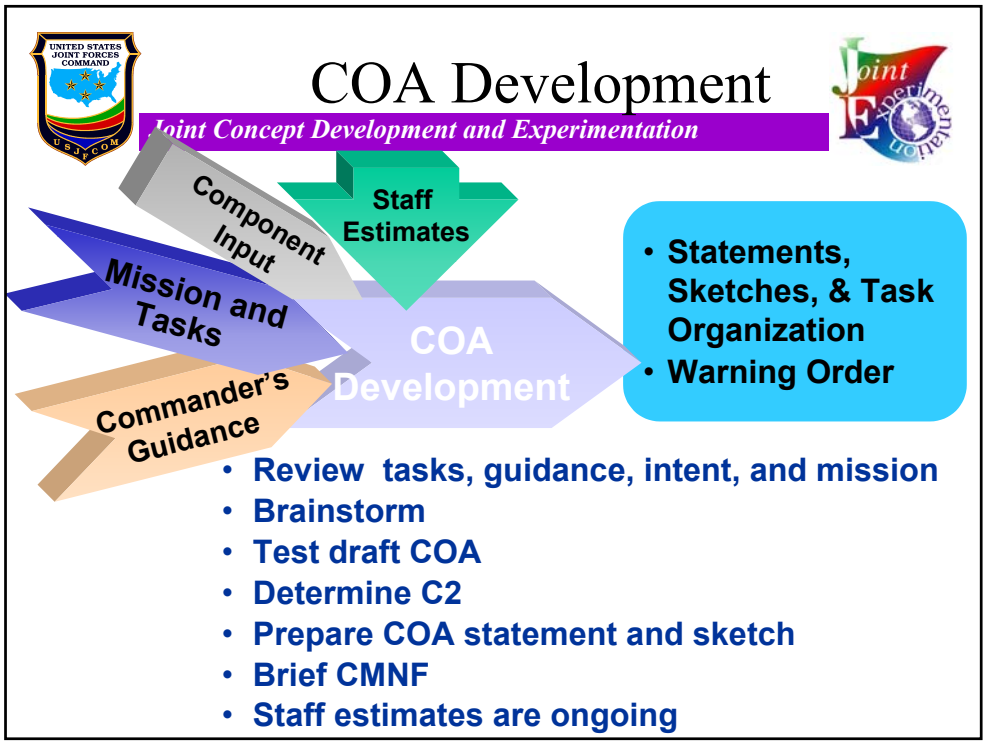
- **Send out at the earliest time to help subordinate staffs meet timelines.**

- **Purpose should be to focus the staff process.**

- The **CDRs Intent can provide criteria for COA development and comparison later**, e.g. flexibility, speed, mass, footprint size, force closure times, etc.

- **Provide the CCIR** in order to facilitate information management and collection efforts. The decision making process is streamlined. **It will come from JIPB and is refined later during wargaming!**

- **PIR (enemy focus) EEFI (friendly info that must be protected) FFIR (info about your own forces)**

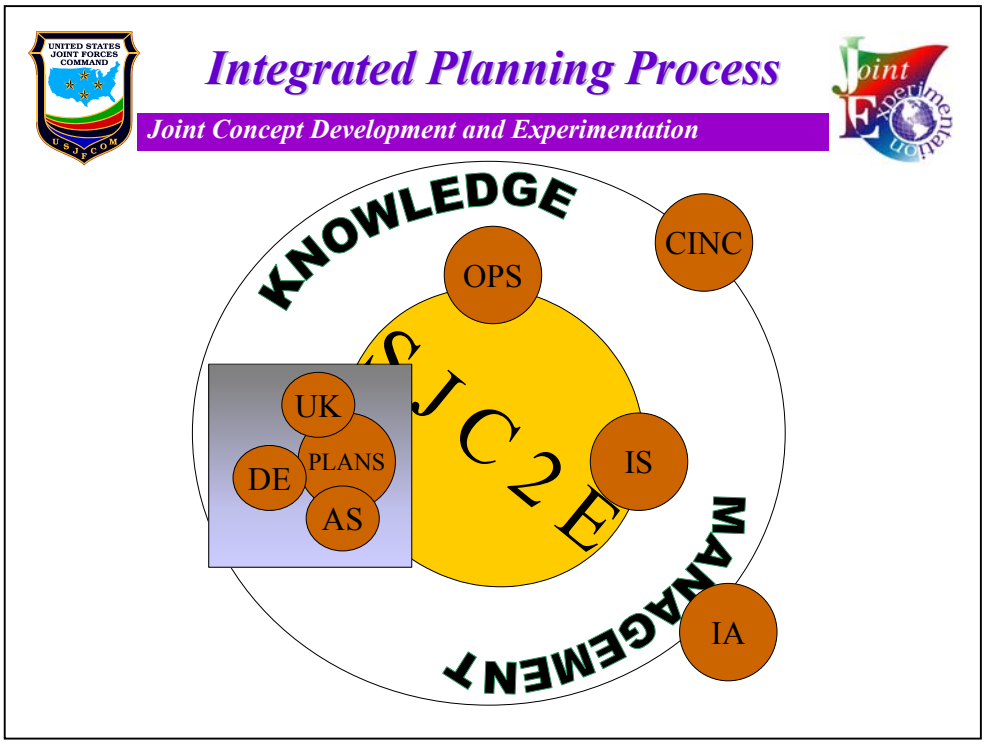


COAs must pass the test of;

- **SUITABLE** - must **accomplish** mission and **comply w/ CINC guidance**.
- **FEASIBLE** - must accomplish mission **within** the established **time, space and resource constraints.**
- **ACCEPTABLE** - must **balance risk with advantage gained** by executing a particular COA.
- **DISTINGUISHABLE** - each COA must be **significantly different** from the others.
- **COMPLETE** - incorporates major tasks and operations to be accomplished to include;; **forces required**, **logistics** concept, **employment** concept, **reserve force** concept, **time estimates** for reaching termination objectives, and **end state.**

- Must develop a **rough TPFDD** to look at **feasibility.**

- Look at **phasing** to focus your efforts.



The **Plans Group** is to provide the MNF commander with a more integrated approach to planning focused in future operations. It also forms the basis for an expanded, interactive Joint Planning Center (JPC) linked through the collaboration network to conduct operational planning.

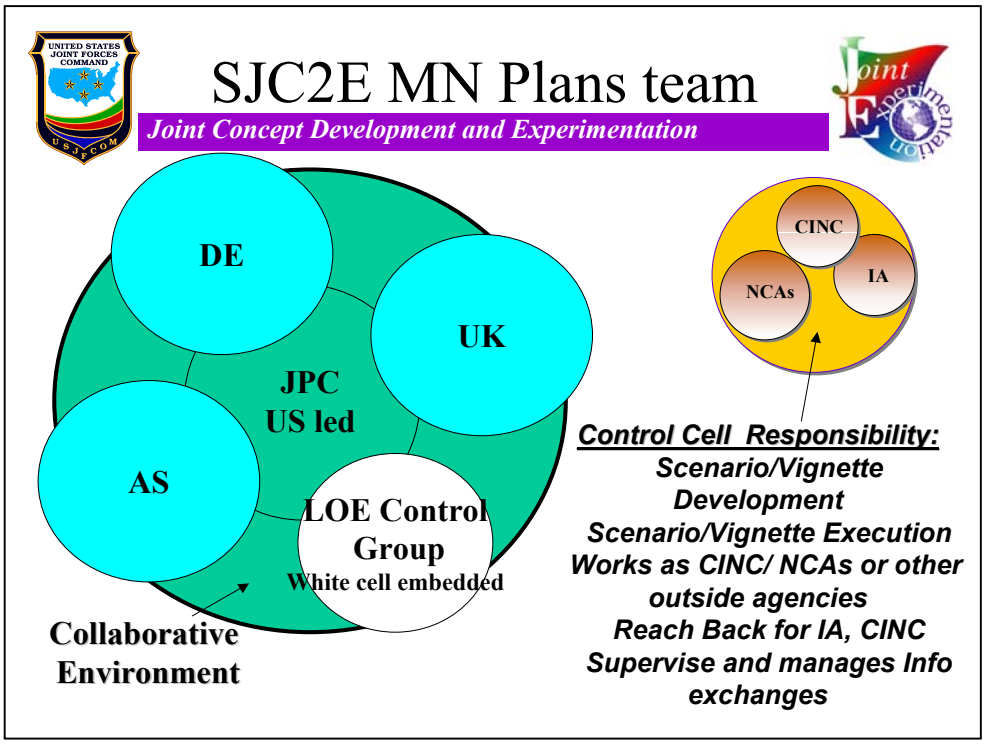
The **Operations Group** focuses on current operations. They perform the integrating and synchronizing function for current operations by monitoring on-going actions and assisting the Information Superiority Group in assessing the outcomes and effects achieved as required to achieve the Commander's intent and guidance. When necessary, the Operations Group will revise or direct changes to an existing order based on the situation, through issuance of changes to that order . A close relationship with the Plans and Information Superiority Group is required to ensure that future operations encompass and adequately address the assessments of on-going operations.

The **Information/Knowledge Management Group** is that element of the SJC2E that provides knowledge management and technical support to MNF planning and execution.

On the technical side, this Group serves as both the network planning/control section and the technical support section, ensuring that the SJC2E has the connectivity and systems availability necessary to support operations. The knowledge management section supports the SJC2E by facilitating the dynamic creation, discovery, manipulation and provision of the right information, to the right people, at the right time, in the right format. Properly planned and executed, knowledge management allows decision superiority through a culture of information sharing. This Group may be utilized as either augmentees or as a "plug" to an existing operational headquarters.

Reach-Back and Augmentation

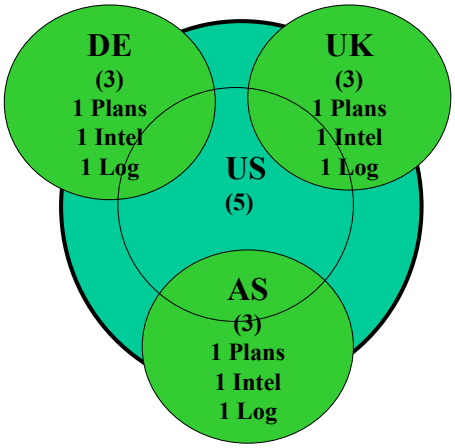
The MNF headquarters integrates support from distributed staffs, SME's and COE for intelligence, planning expertise, effects, administration, and logistic support. This reach-back capability allows the MNF headquarters to operate from geographically distributed locations to best support the mission, situation and commander requirements. The MNF is not only augmented by the special capabilities of the SJC2E, but must be also augmented by designated, trained, and exercised augmentation, "plugs", and liaisons capable of rapid deployment to join the staff or linked by collaborative planning tools. Functional "plugs" might include: rear area protection, Civil Military Operations Center (CMOC); liaison might include Joint Warfare Analysis Center (JWAC) normally located at the CINC, TRANSCOM, National Intelligence Support Team (NIST) normally located at the CINC, and component command liaisons; augmentees would be tailored to augment the existing capabilities of the SJC2E and existing MNF headquarters staff. Depending upon the situation, it may also be appropriate to include liaison elements from our regional allies and key coalition partners to aid in coalition building and maintenance.



The Joint Planning Center (JPC) conducts Crisis Action Planning and performs future operations planning. The JPC participates in support of the CINC J5 in CONPLAN development pre-crisis and during contingency operations. It is the focal point for: orders development, mission refinement, planning guidance, COA development/ analysis and OPORD coordination, makes recommendations to Joint Coordination Board(JCB). A virtual collaborative planning network, the JPC is composed of planning representatives from the MNF headquarters, CINC's staff, Multi-National Commands, subordinate components, and other agencies functionally oriented to the MNF commander's mission. After receiving specific guidance from the JCB, the JPC employs this collaborative network on a continuous basis to develop orders as required to meet the MNF commander's desired effects and ultimately the CINC's objectives. The developed order is then forwarded to the Joint Operations Center for review and release after approval by the MNF commander or his designated representative. The Plans Director assumes leadership of the JPC within the MNF.

MN LOE Plans Team

Joint Concept Development and Experimentation



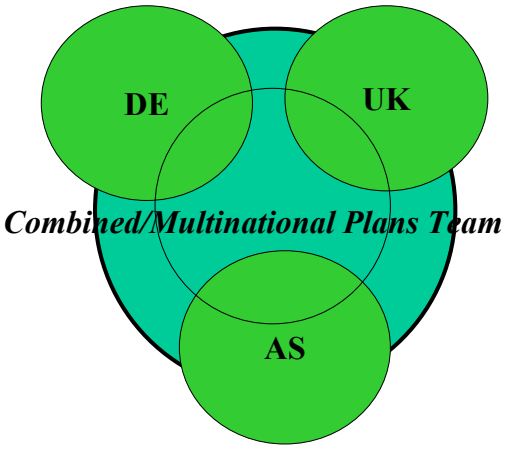
Plans director distributes billets based on expertise and experience to fill the SJC2E plans team roster

US planners;

SOF/Civil affairs
Ground
Air
Naval
Red teamer/Force Protection

SJC2E MN Plans team

Joint Concept Development and Experimentation

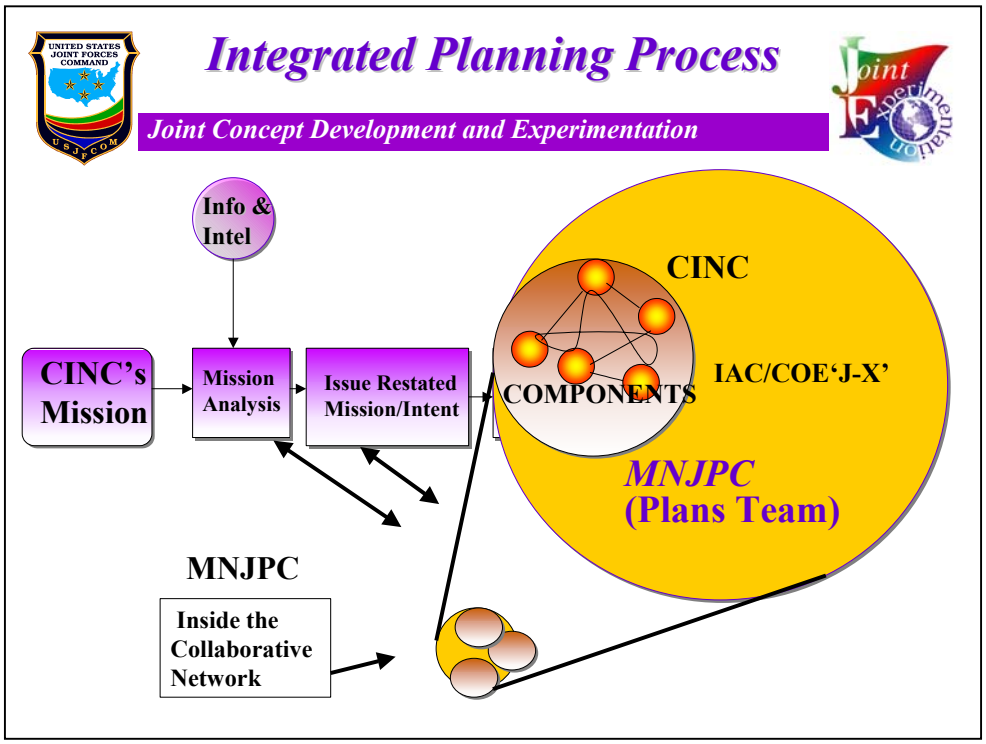


Combined/Multinational Plans Team

From 14 to 17

Plans Team (17)

- **Plans Director**
- **Intel Analysts (2)**
- **Planners (5)**
- **Logistics Coordinator**
- **Logistics Deployment Planner**
- **Logistics Sustainment Planner**
- **Blue/Red Cell (2)**
- **Political / Military Planner**
- **Civil Affairs Planner**
- **Ops Law Planner**
- **Force Protection Planner (TBM/WME)**



The MNJPC (Plans Team) is in a collaborative network that includes the CINC, Components and the IAC/COE.
CINC, IAC/COE and components functions and responses are conducted by the White Cell. The Plans Team is the portion of the CJFHQ, which is replicated in this experiment. The other parts of the CJFHQ: OPS, Information Superiority, Knowledge/Information Management and Command are either not applicable to this LOE or are replicated by the White Cell.
Business rules are written to provide a framework upon which the collaborative sessions will operate. Team leaders from the nation designated as the Lead Nation or the CJFHQ, whichever is the case, play a large part in conducting smooth and coherent collaboration sessions. The Business Rules that follow address who is performing which functions, why they perform them, and what tools are used in which way. Business rules also address what the final form of the product should look like. There are business rules that also address how the different functions of the team work, both internally focused as well as across the spectrum of the entire scenario. Business rules have owners/advocates (e.g., individuals in charge of groups/cells, Information Managers, etc.) who are responsible for ensuring the rules are understood, followed, and modified as necessary, with the changes communicated to the participants. The business rules provide a common starting point. Team leaders may alter the rules as required by forwarding all proposed changes to the appropriate (Lead Nation/CJFHQ) Information Manager (IM).

APPENDIX B

Organizational Structure Characterizations

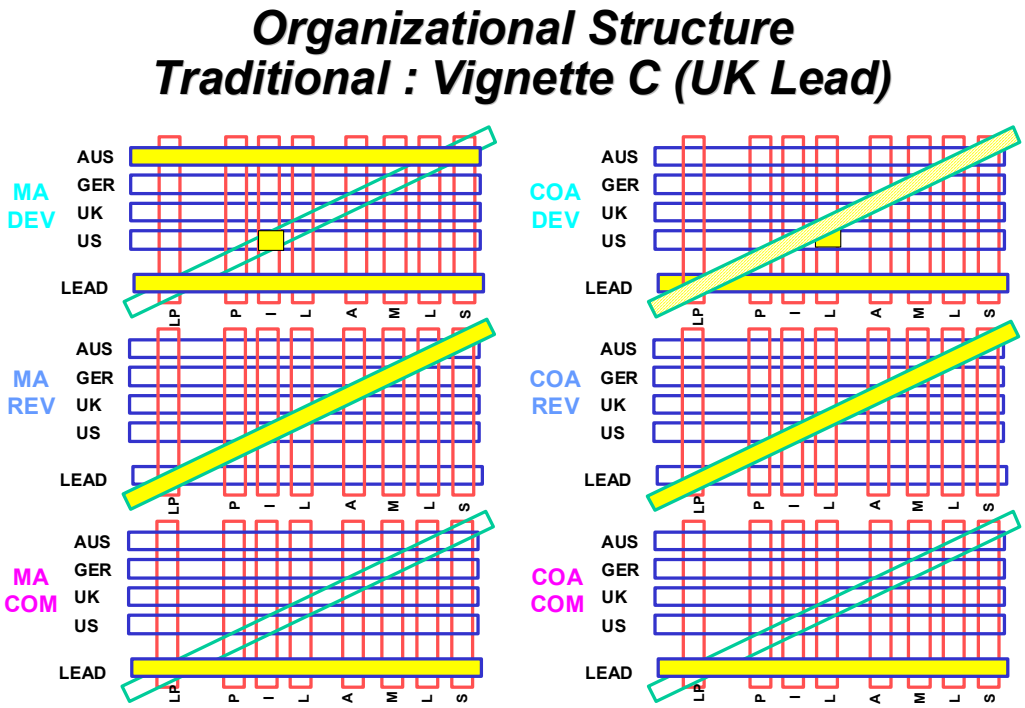


Figure B-1a: Organizational Structure Vignette C, Traditional

During this vignette the 'lead' country built the MA and COA while the contributing countries provided input via text chat. The UK approach was to combine development and review process. While they were building, the other nations were reviewing.

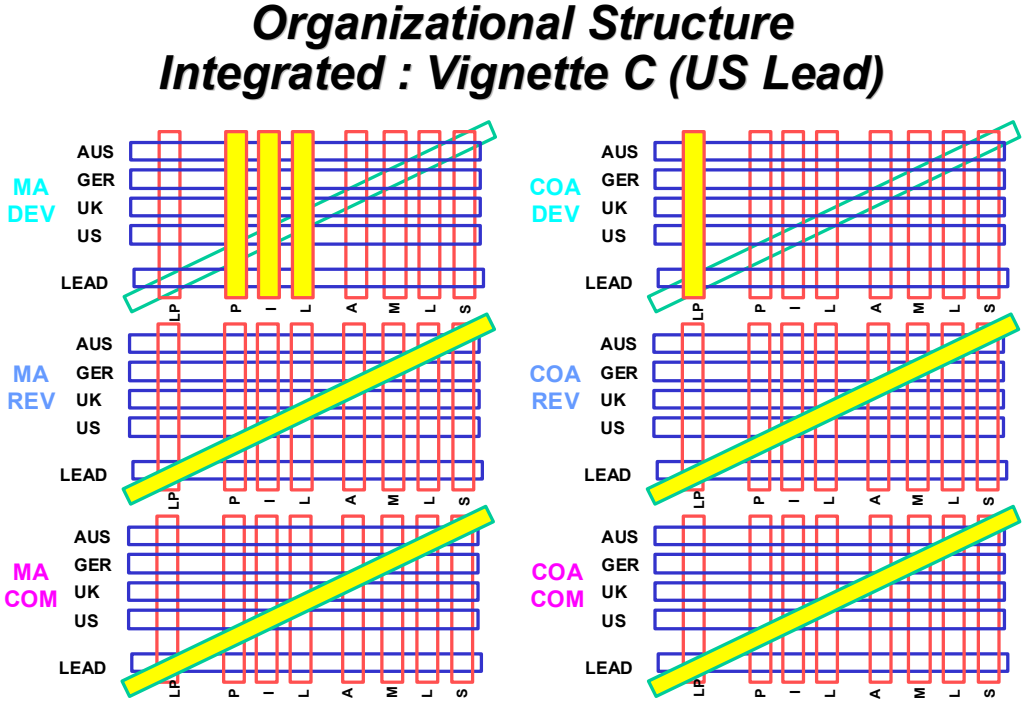


Figure B-1b: Organizational Structure Vignette C, Traditional

The US delegated COA development lead to UK.

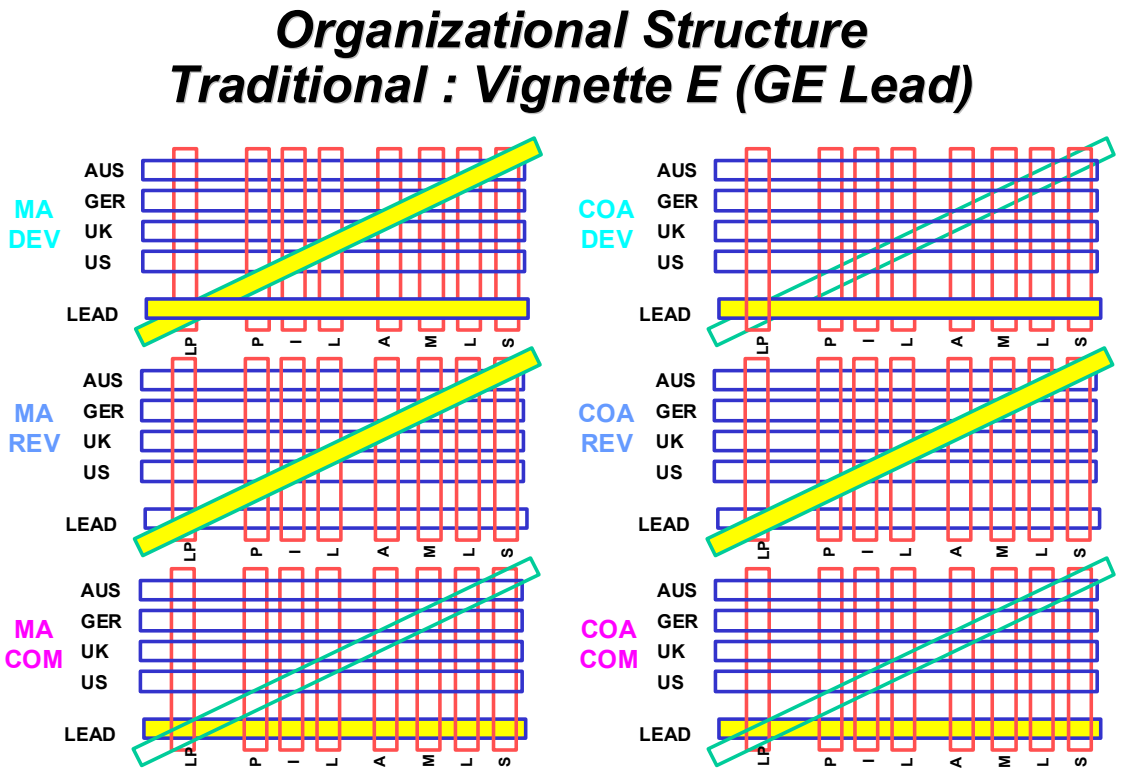


Figure B-2a: Organizational Structure Vignette E, Traditional

The Lead Nation had primary responsibility for MA development, but all nations were involved in a brainstorming session prior to the start of MA development. The Lead Nation also had primary responsibility for COA development, but monitored the discussions of other nations during the development.

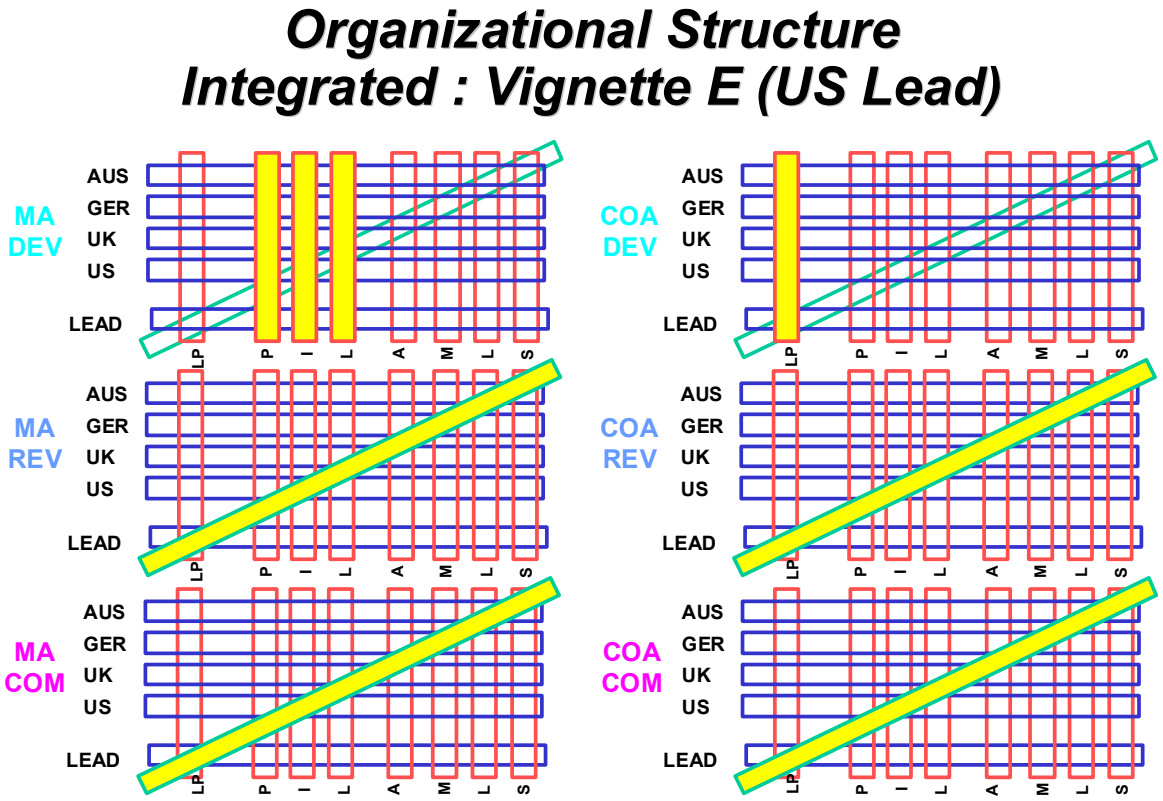


Figure B-2b: Organizational Structure Vignette E, Integrated

The US delegated COA development lead to AUS.

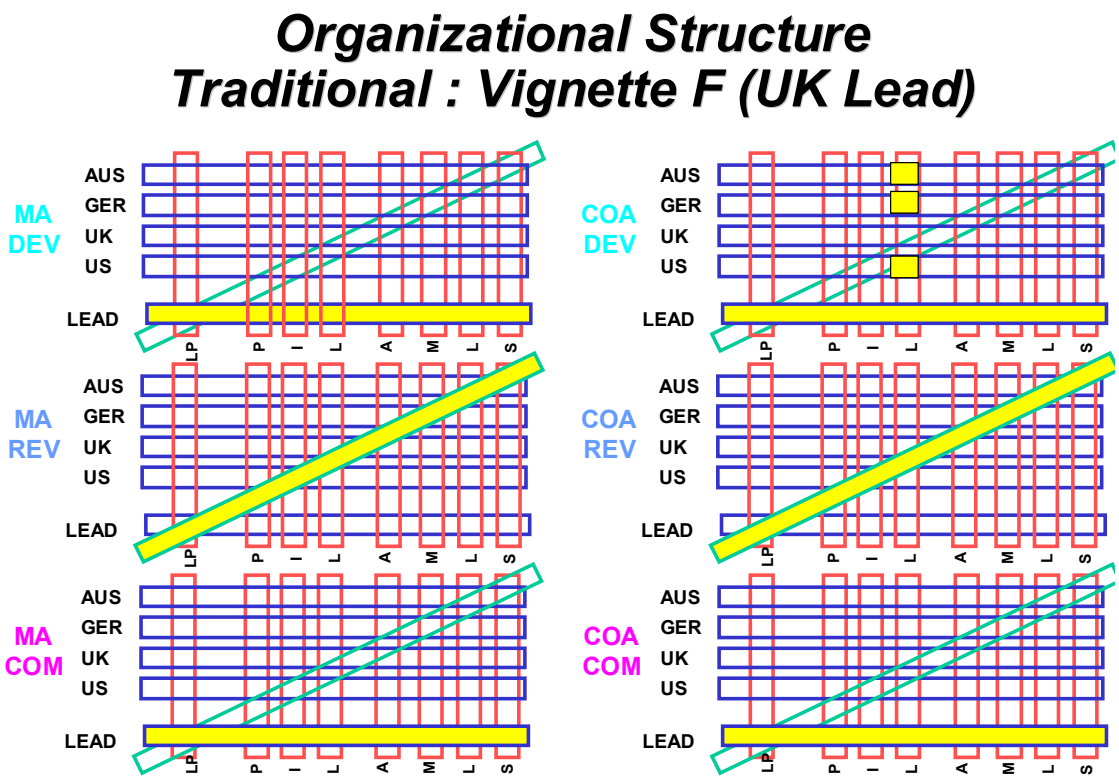


Figure B-3a: Organizational Structure Vignette F, Traditional

During COA development all nations were requested to supply comments and suggestions on the force structure required.

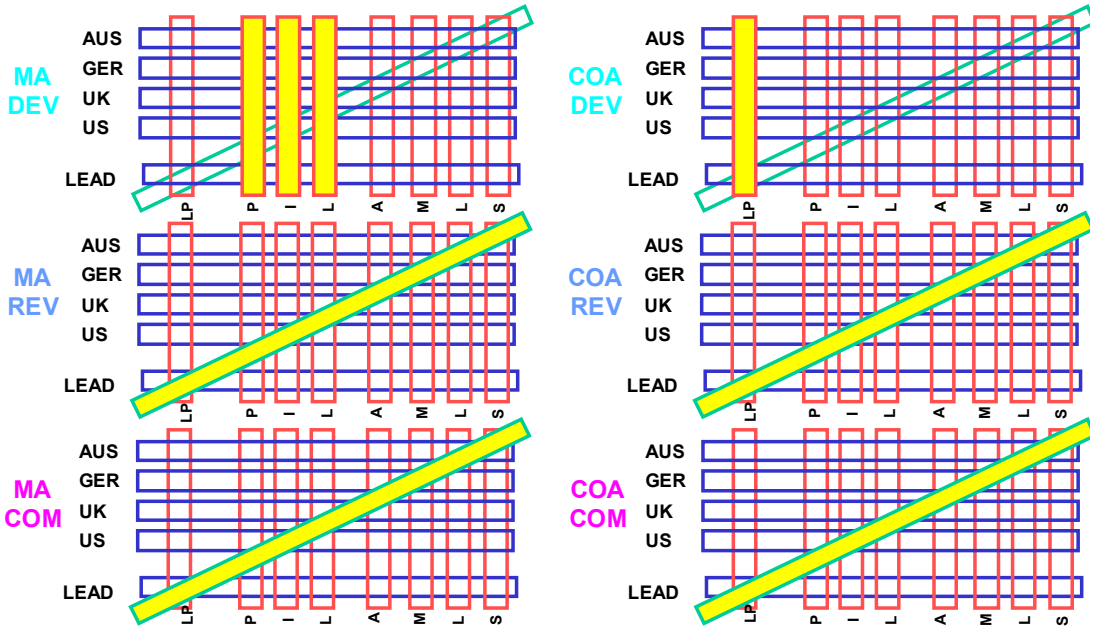


Figure B-3b: Organizational Structure Vignette F, Integrated

US COA as well. Those not involved in MA development were directed to take part in a discussion on a broad planning concept for the COA.

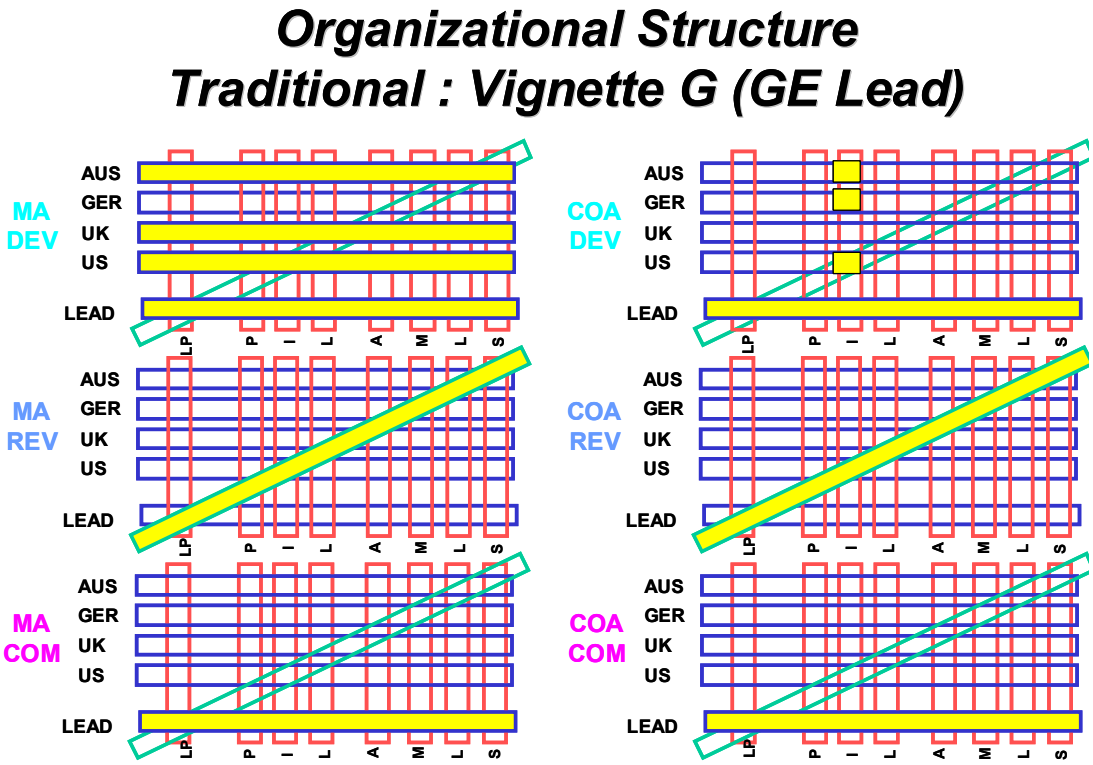


Figure B-4a: Organizational Structure Vignette G, Traditional

During COA development each nation had a specific Intel task: US to assess opponent's military capability, UK to assess political/economic situation, and AUS had the EJC2E task.

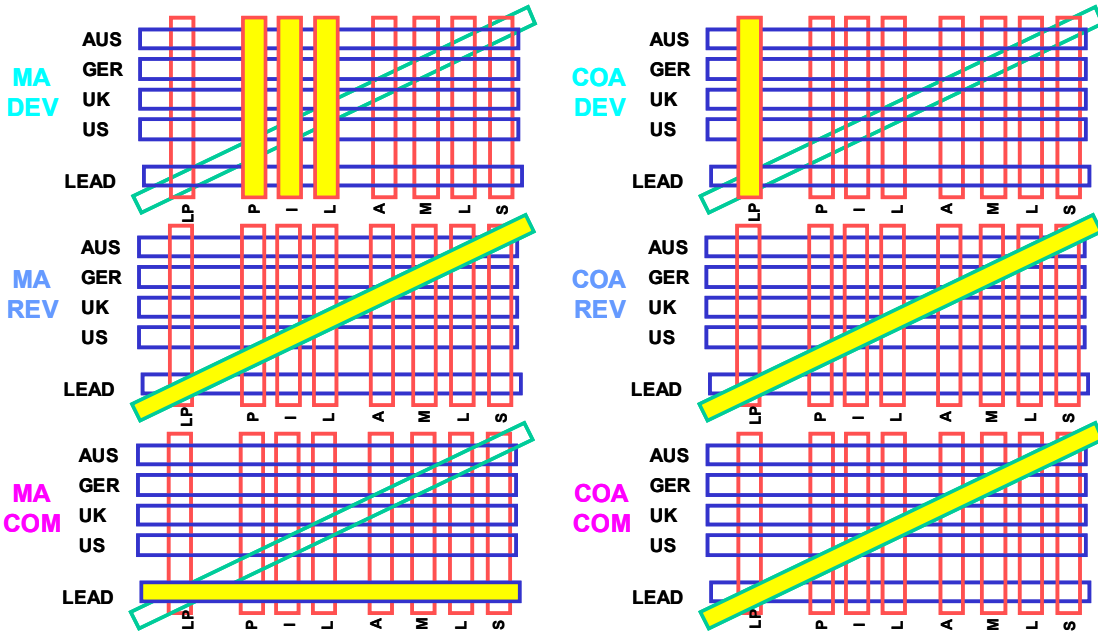


Figure B-4a: Organizational Structure Vignette G, Integrated

Even though there were teams and all hands review there were some complaints that the lead nation appeared to be working off-line.

Organizational Structure
Traditional : Vignette H (US Lead)

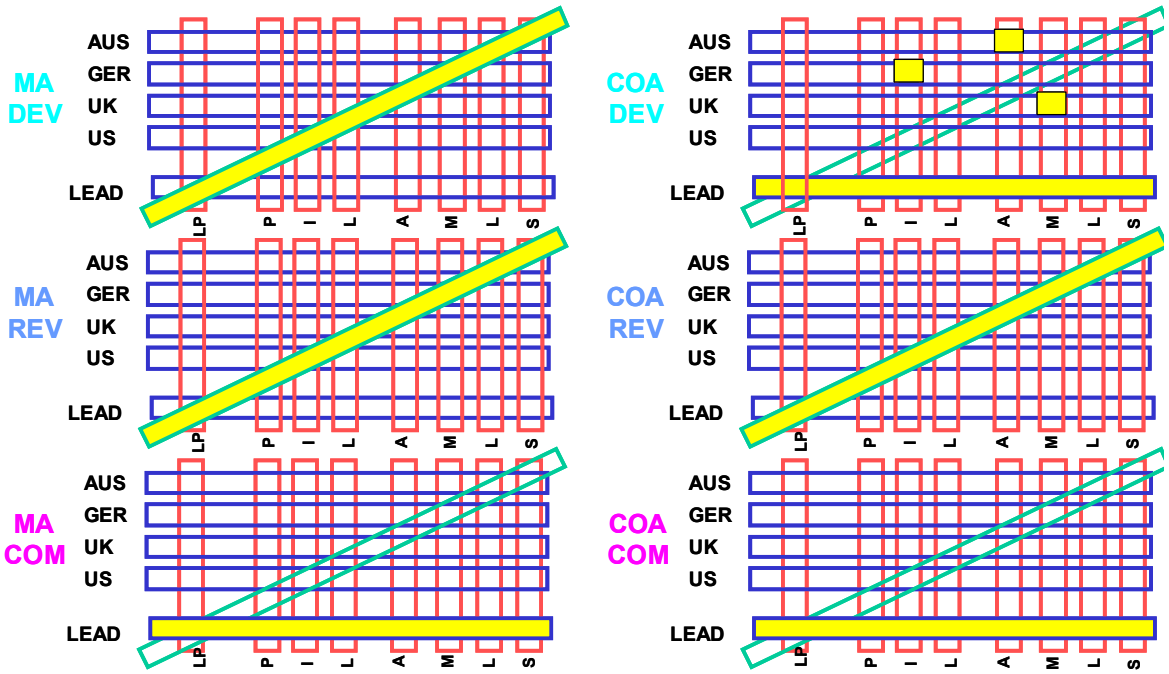


Figure B-5a: Organizational Structure Vignette G, Traditional

Organizational Structure
Integrated : Vignette H (GE Lead)

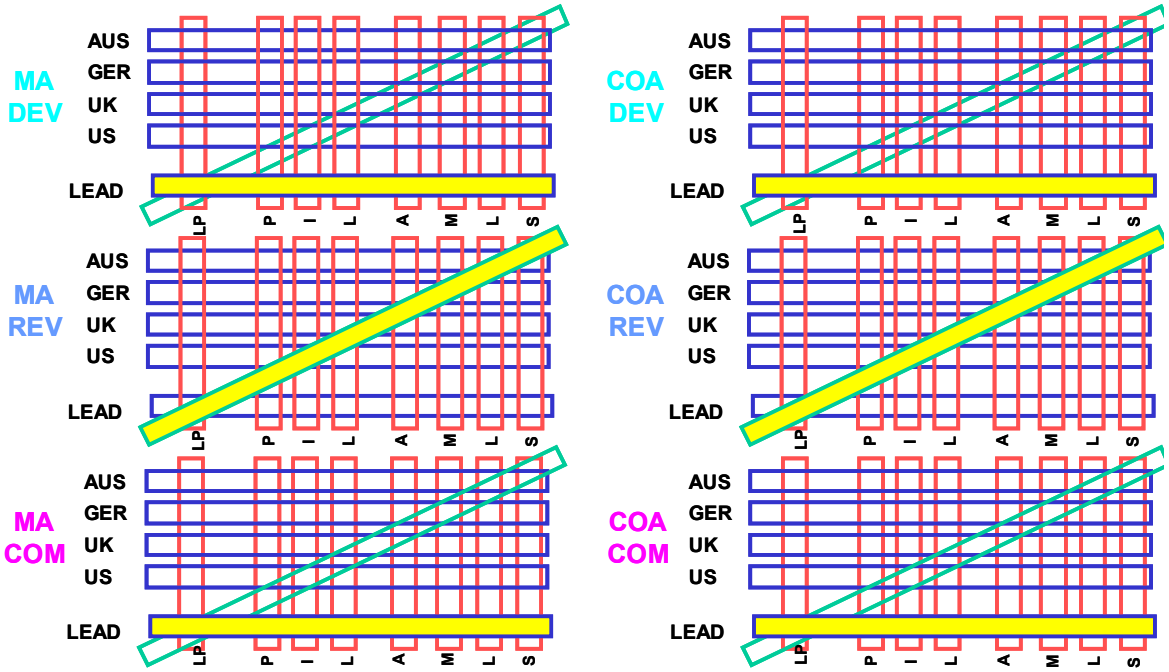


Figure B-5b: Organizational Structure Vignette H, Integrated

During this vignette the 'lead' country built the MA and COA while the contributing countries provided input via text chat. Functional teams were not used.

Organizational Structure
Traditional : Vignette I (US Lead)

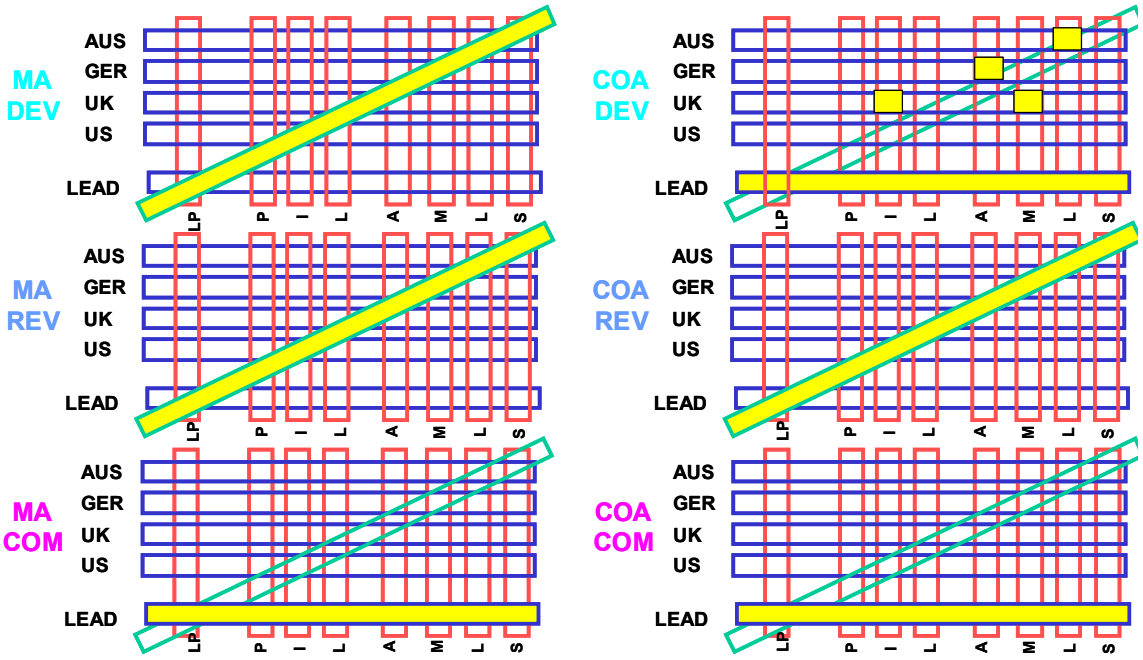


Figure B-6a: Organizational Structure Vignette I, Traditional

Organizational Structure
Integrated : Vignette I (UK Lead)

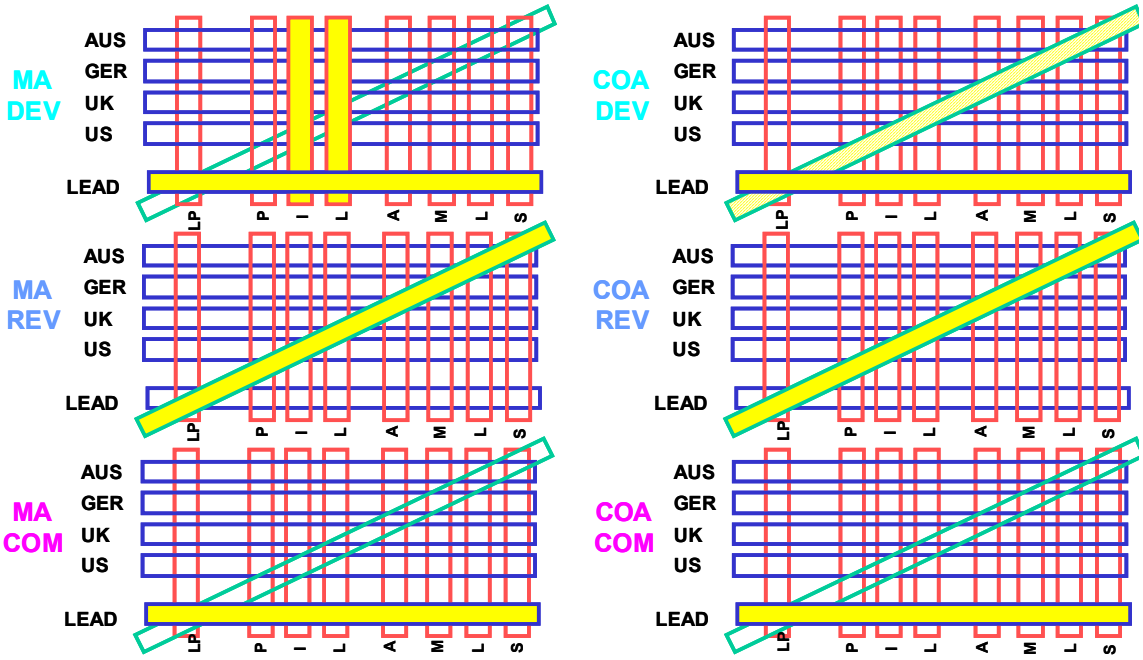


Figure B-6b: Organizational Structure Vignette I, Integrated

During this vignette the 'lead' country built the MA and COA while the contributing countries provided input via text chat. Functional teams were used for logistics and Intel.
UK style was to combine development and review process. While they were building, the other nations were reviewing.

Organizational Structure
Traditional : Vignette J (AU Lead)

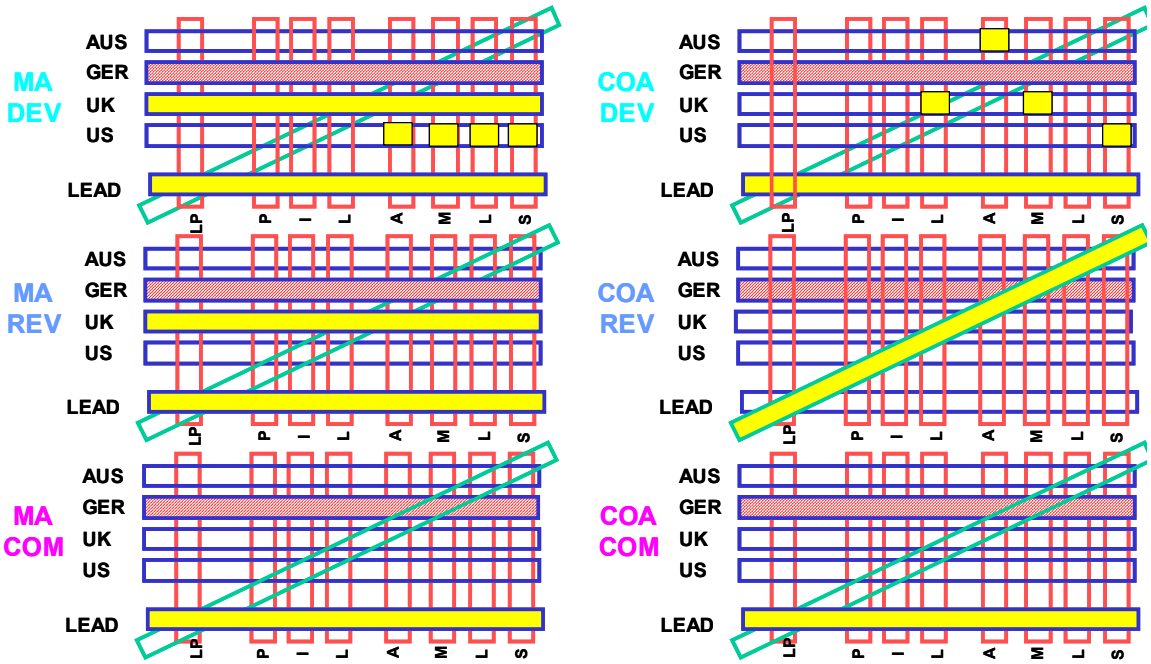


Figure B-7a: Organizational Structure Vignette J, Integrated

Red cross-hatch markings indicate that Germany lost its network connection for the entire vignette.

Organizational Structure
Integrated : Vignette J (US Lead)

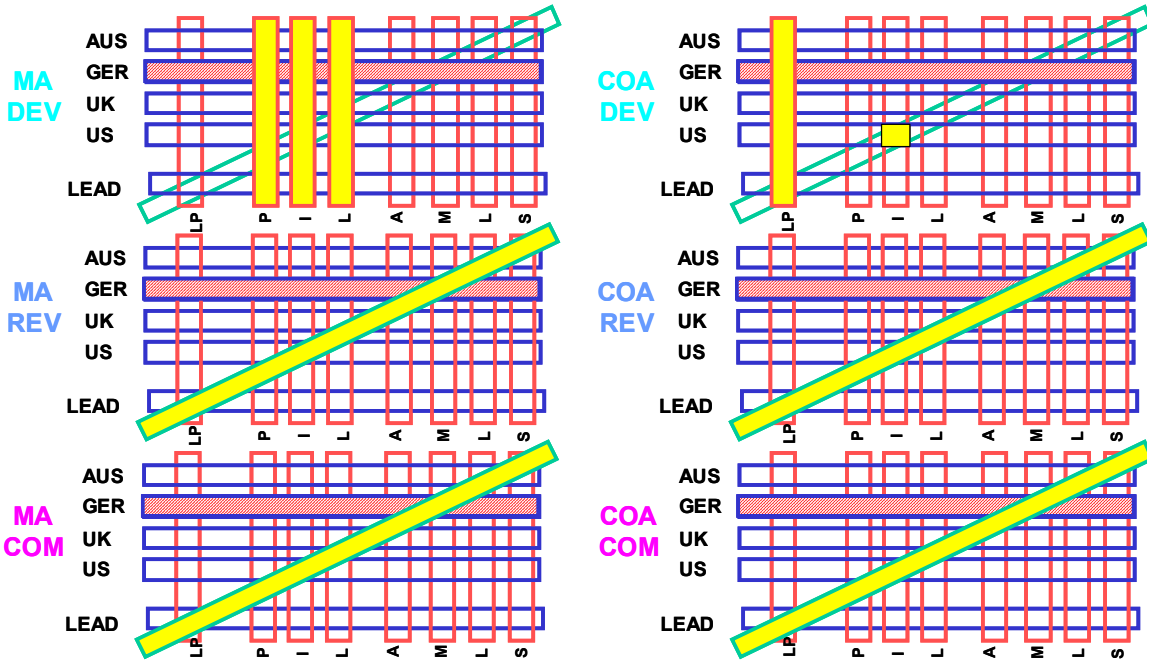


Figure B-7b: Organizational Structure Vignette J, Integrated

Red cross-hatch markings indicate that Germany lost its network connection for the entire vignette.

Intentionally Left Blank

APPENDIX C

Vignette Evaluation Questionnaire Data

The three questions shown in Table C-1 were administered in the Vignette Questionnaires, under Section II, Process Characterization. These questions were distributed during Vignettes C through J. The table shows the numerical breakdown of responses by vignette for the Integrated Team.

Table C-1

Vignette Questionnaire Section II, Process Characterization, Integrated Team

1. **Lack of continuous audio was a significant detriment to collaboration**	Agree	Undecided	Disagree	No Opinion	Vignette ID	Total Responses
Integrated	1	0	1	0	C	2
Integrated	1	1	3	1	E	6
Integrated	1	0	2	1	F	4
Integrated	3	1	1	0	G	5
Integrated	6	2	2	0	H	10
Integrated	5	0	1	0	I	6
Integrated	3	0	3	1	J	7
	20	**4**	**13**	**3**		**40**
2. More input from coalition partners during *initial development* of the Mission Analysis or COA would improve the product.						
Integrated	1	0	1	0	C	2
Integrated	3	2	1	0	E	6
Integrated	1	0	3	0	F	4
Integrated	1	1	3	0	G	5
Integrated	6	1	3	0	H	10
Integrated	2	1	2	1	I	6
Integrated	2	2	3	0	J	7
	16	**7**	**16**	**1**		**40**
3. During collaborative planning I prefer a predefined structure (such as a Mission Analysis matrix) to a free-form notepad tool.						
Integrated	2	0	0	0	C	2
Integrated	6	0	1	0	E	7
Integrated	3	0	1	0	F	4
Integrated	2	1	2	0	G	5
Integrated	6	2	2	0	H	10
Integrated	4	1	1	0	I	6
Integrated	4	0	3	0	J	7
	27	**4**	**10**	**0**		**41**

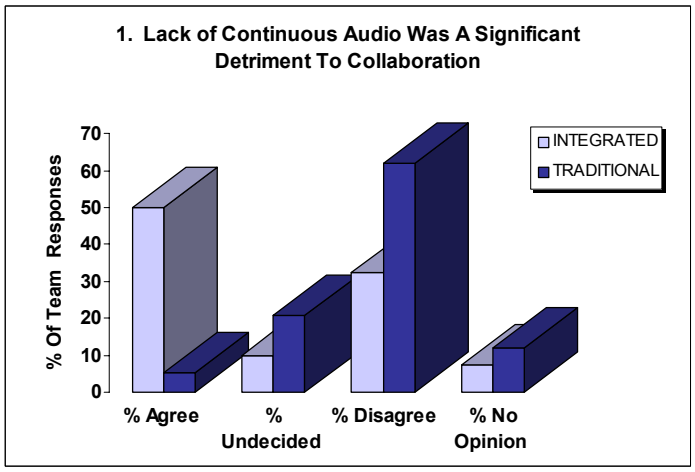
The three questions shown in Table C-2 are the same as those shown in Table C-1. This table shows the numerical breakdown of responses by vignette for the Traditional Team.

Table C-2

Vignette Questionnaire Section II, Process Characterization, Traditional Team

1. **Lack of continuous audio was a significant detriment to collaboration**	Agree	Undecided	Disagree	No Opinion	Vignette ID	Total Responses
Traditional	0	0	2	0	C	2
Traditional	2	0	12	1	E	15
Traditional	0	0	1	0	F	1
Traditional	0	7	4	1	G	12
Traditional	1	3	7	2	H	13
Traditional	0	1	6	1	I	8
Traditional	0	1	4	2	J	7
	3	**12**	**36**	**7**		**58**
2. More input from coalition partners during *initial development* of the Mission Analysis or COA would improve the product.						
Traditional	0	2	0	0	C	2
Traditional	8	2	5	0	E	15
Traditional	1	1	0	0	F	2
Traditional	4	6	2	0	G	12
Traditional	5	3	5	0	H	13
Traditional	3	1	6	0	I	10
Traditional	2	0	4	0	J	6
	23	**15**	**22**	**0**		**60**
3. **During collaborative planning I prefer a predefined structure (such as a Mission Analysis matrix) to a free-form notepad tool.**						
Traditional	2	0	0	0	C	2
Traditional	9	2	1	2	E	14
Traditional	1	0	0	0	F	1
Traditional	9	2	1	0	G	12
Traditional	6	4	2	1	H	13
Traditional	7	1	2	0	I	10
Traditional	4	0	2	0	J	6
	38	**9**	**8**	**3**		**58**

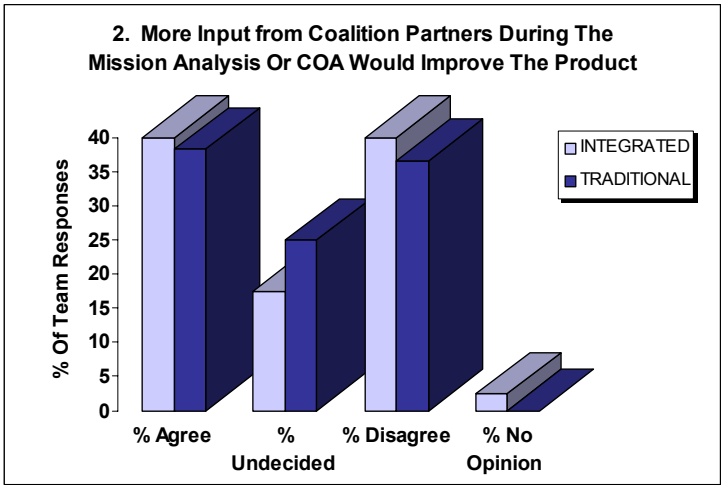
Figures C-1 through C-3 present the above tabulated data in graphical form. Figures C-4 through C-6 break out the same information for each question by experiment week. Figures C-7 through C-9 break out the information by participating country.



	% Agree	% Undecided	% Disagree	% No Opinion
INTEGRATED	50.00	10.00	32.50	7.50
TRADITIONAL	5.17	20.69	62.07	12.07

Figure C-1: Process Characterization Question #1

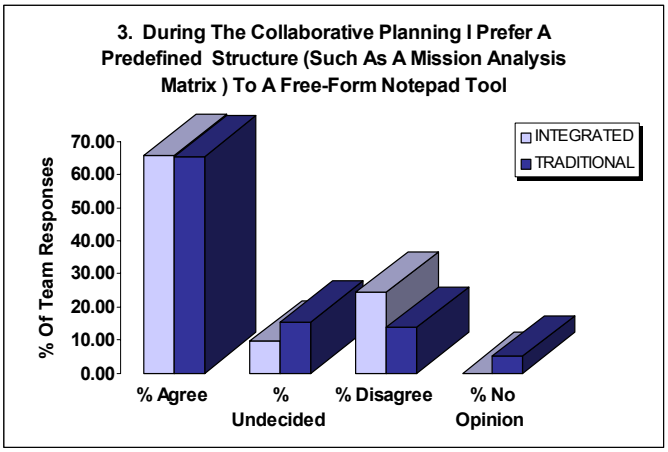
The Integrated Team submitted 40 responses to Question 1 and the Traditional Team submitted 58 responses.



	% Agree	% Undecided	% Disagree	% No Opinion
INTEGRATED	40.00	17.50	40.00	2.50
TRADITIONAL	38.33	25.00	36.67	0.00

Figure C-2: Process Characterization Question 2

The Integrated Team submitted 40 responses to Question 2 and the Traditional Team submitted 60 responses.



	% Agree	% Undecided	% Disagree	% No Opinion
INTEGRATED	65.85	9.76	24.39	0.00
TRADITIONAL	65.52	15.52	13.79	5.17

Figure C-3: Process Characterization Question #3

The Integrated Team submitted 41 responses to Question 3 and the Traditional Team submitted 58 responses.

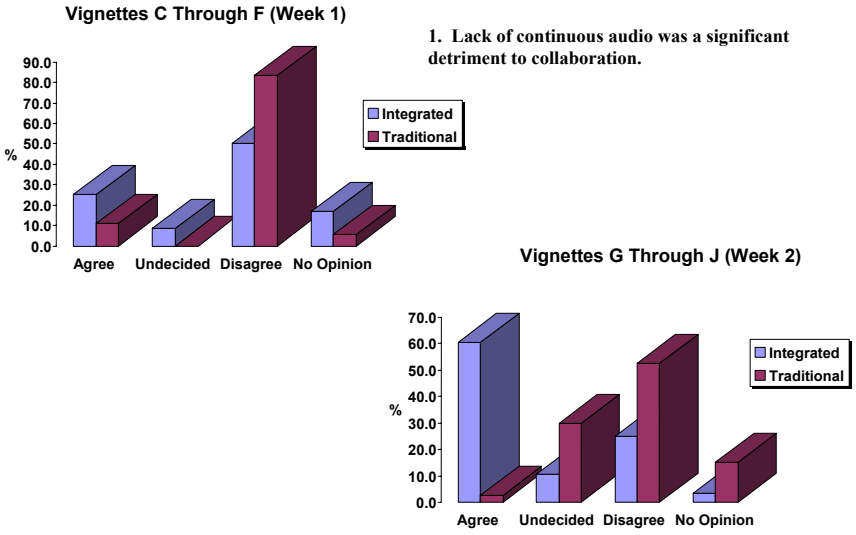


Figure C-4: Comparison Of Process Characterization Question 1 By Experiment Week

The graphs show a comparison of the responses given during the first and second weeks of the experiment. Values plotted are the percent of either total Integrated or total Traditional responses returned for this question each week.

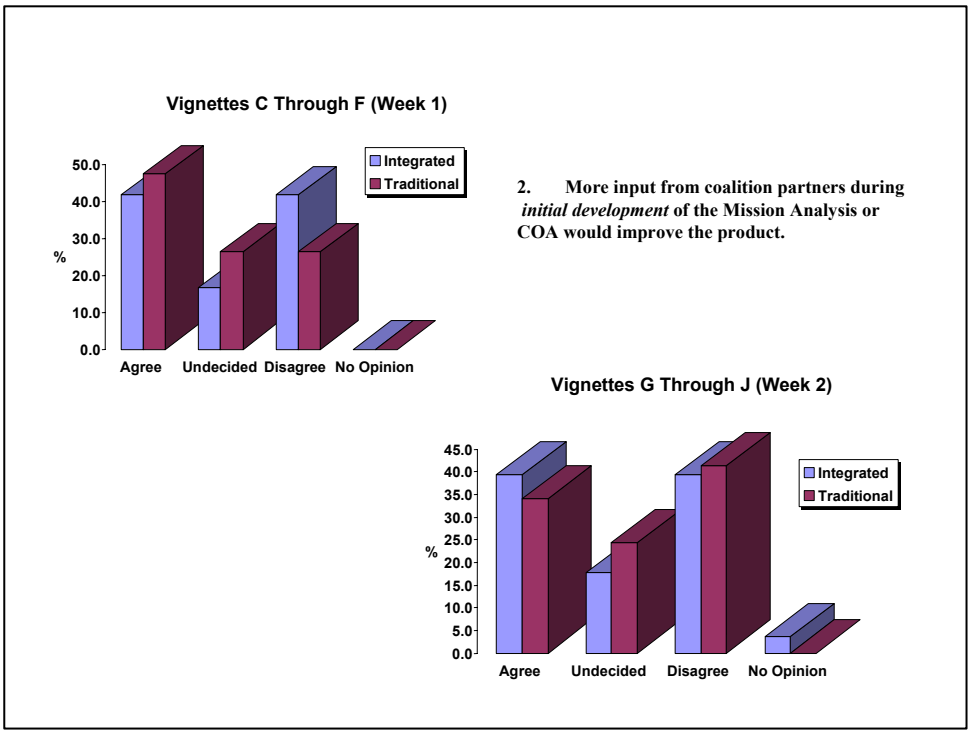


Figure C-5: Comparison Of Process Characterization Question 2 By Experiment Week

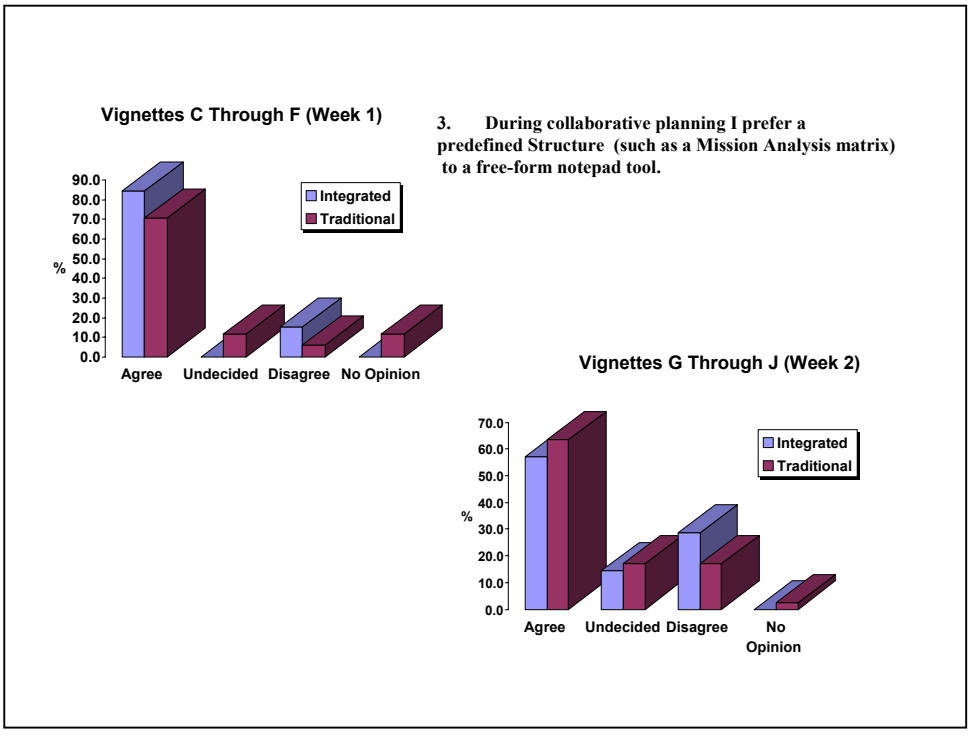
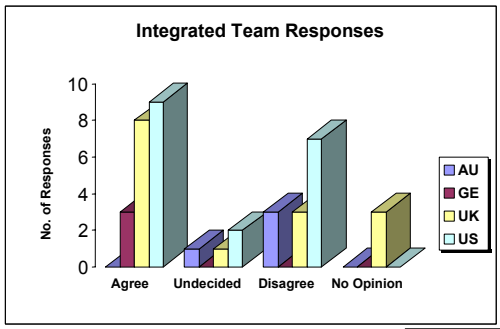


Figure C-6: Comparison Of Process Characterization Question 3 By Experiment Week



1. Lack of continuous audio was a significant detriment to collaboration.

Integrated	Agree	Undecided	Disagree	No Opinion
AU	0	1	3	0
GE	3	0	0	0
UK	8	1	3	3
US	9	2	7	0

Traditional	Agree	Undecided	Disagree	No Opinion
AU	2	4	11	2
GE	1	6	3	1
UK	0	1	8	1
US	0	1	14	3

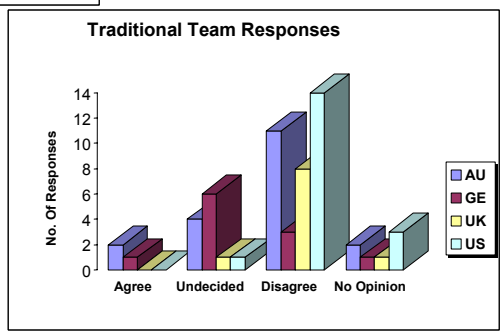
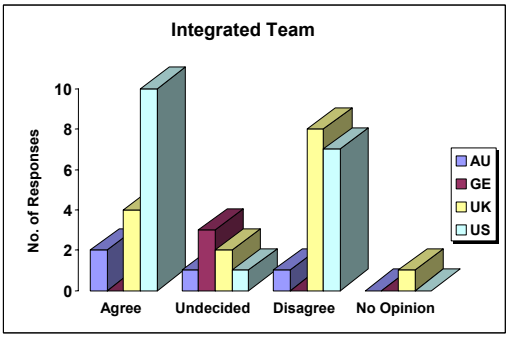


Figure C-7: Process Characterization Question 1, Breakdown by Country

These graphs provide a breakdown of the number of responses by team and country for each of the three process characterization questions. Data include Vignettes C



2. More input from coalition partners during *initial development* of the Mission Analysis or COA would improve the product.

Integrated	Agree	Undecided	Disagree	No Opinion
AU	2	1	1	0
GE	0	3	0	0
UK	4	2	8	1
US	10	1	7	0

Traditional	Agree	Undecided	Disagree	No Opinion
AU	15	0	4	0
GE	1	5	5	0
UK	4	2	6	0
US	3	8	7	0

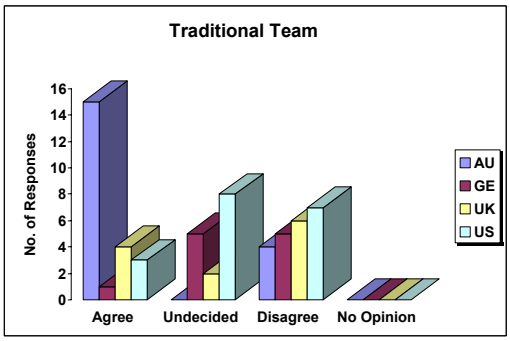
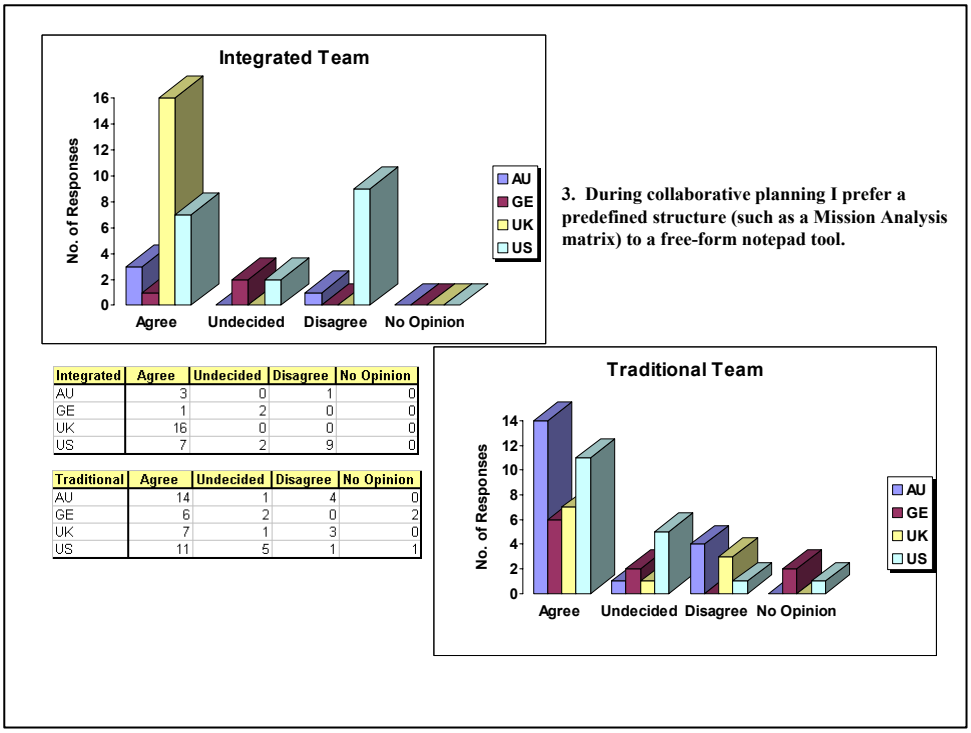


Figure C-8: Process Characterization Question 2, Breakdown by Country

Data include Vignettes C through J.



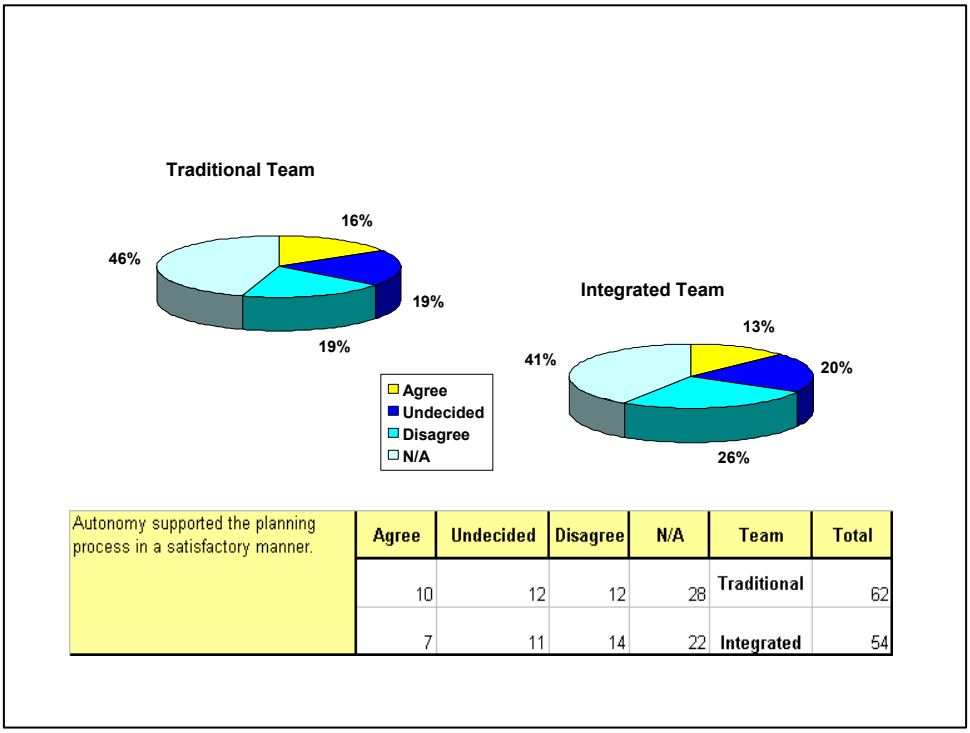
Integrated	Agree	Undecided	Disagree	No Opinion
AU	3	0	1	0
GE	1	2	0	0
UK	16	0	0	0
US	7	2	9	0

Traditional	Agree	Undecided	Disagree	No Opinion
AU	14	1	4	0
GE	6	2	0	2
UK	7	1	3	0
US	11	5	1	1

Figure C-9: Process Characterization **Question 3 By Country**

Data include Vignettes C through J.

The following figures present the data collected from the Vignette Questionnaire, Section III, LOE Evaluation of Tools.



Autonomy supported the planning process in a satisfactory manner.	Agree	Undecided	Disagree	N/A	Team	Total
	10	12	12	28	Traditional	62
	7	11	14	22	Integrated	54

Figure C-10: Vignette Questionnaire Section III, LOE Evaluation of Tools

During a post-experiment meeting at APL to discuss preliminary results, some of the participants who had been observers expressed surprise that there were any agree responses. Questionnaires were reviewed again and the following breakdown of Agree responses was observed:

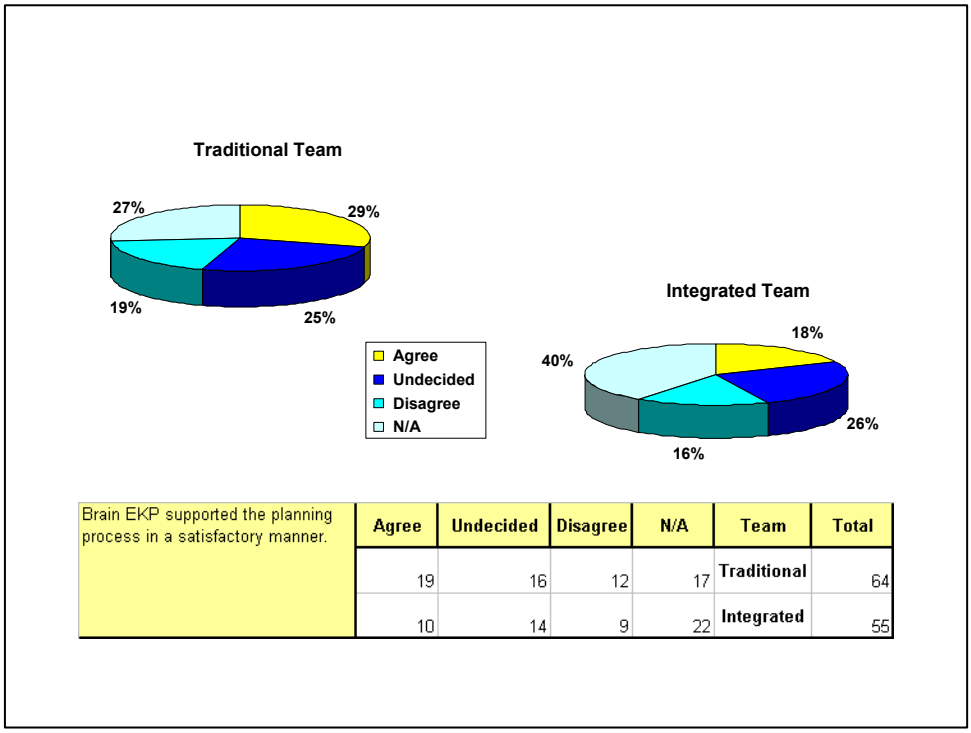
Traditional Team

- 70% of the Agree responses were from Germany.
- 20% of the Agree responses were from the United Kingdom.
- 10% of the Agree responses were from Australia.
- Responses came from Vignettes F, G and H.

Integrated Team

- 86% of the responses came from the US team. The majority of the Agree responses came from Vignettes G through I, and all were from the US for these vignettes.
- At least 3 of the US Agree responses came from the Integrated Teams Intel person.
- The other 3 US Agree responses may be invalid. It appears that another Integrated player may have duplicated the Intel persons questionnaire to save time. While this person appears to have then edited the duplicated form in some areas, the tools responses appear to be identical during several vignettes. It could also be that he happened to agree and felt no need for change.

Because there appeared to be more than one instance of Questionnaire duplication during this experiment (duplication did not appear limited to the US) some of the tools data should be regarded with caution. If a form is duplicated because the participant agreed with the responses of another participant and wanted to save time it is perfectly legitimate, however if the participant forgot to check all responses to make sure they agreed with his own opinions the form effectively becomes a double vote for the original respondent.



Brain EKP supported the planning process in a satisfactory manner.	Agree	Undecided	Disagree	N/A	Team	Total
	19	16	12	17	Traditional	64
	10	14	9	22	Integrated	55

Figure C-11: Vignette Questionnaire Section III, LOE Evaluation of Tools

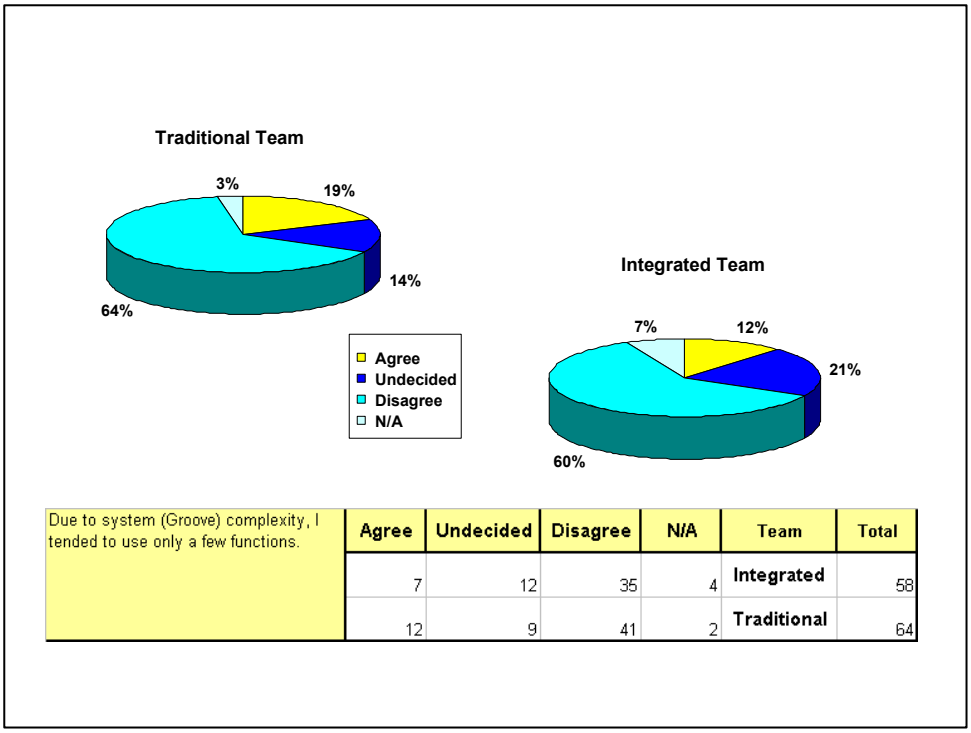
The breakdown of Agree responses for the BrainEKP question were as follows:

Traditional Team (29% of Total Traditional Respondents Agreed)

- 58% of the Agree responses were from Australia
- 21% were from the United Kingdom
- 16% were from the US
- 5% were from Germany
- 68% of all Agree Responses were provided during the second week of the experiment (Vignettes G-J)

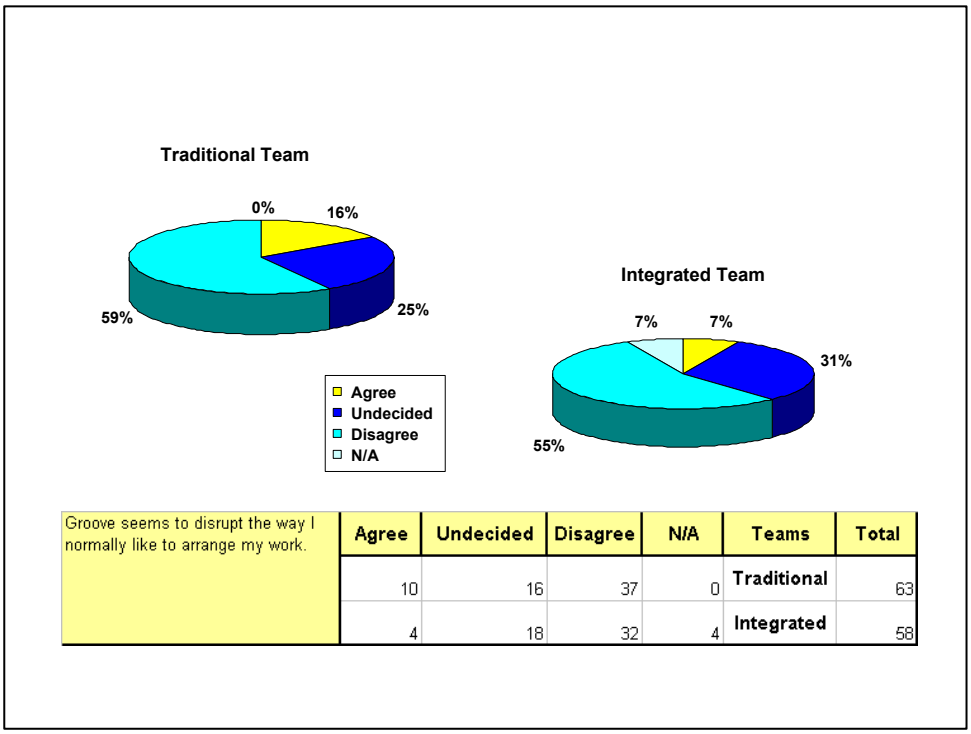
Integrated Team (18% of Total Integrated Respondents Agreed)

- 70% were from the US
- 30% were from GE
- 60% of the Agree Responses were provided during the second week of the experiment (Vignettes G-J). 83% of those were from the US.



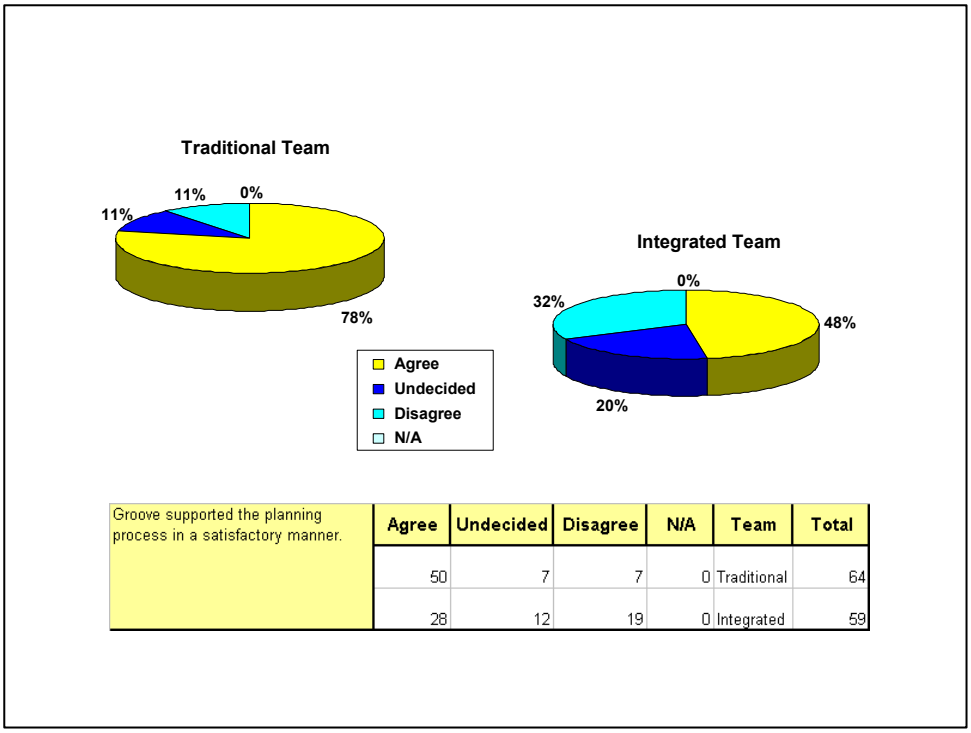
Due to system (Groove) complexity, I tended to use only a few functions.	Agree	Undecided	Disagree	N/A	Team	Total
	7	12	35	4	Integrated	58
	12	9	41	2	Traditional	64

Figure C-12: Vignette Questionnaire Section III, LOE Evaluation of Tools



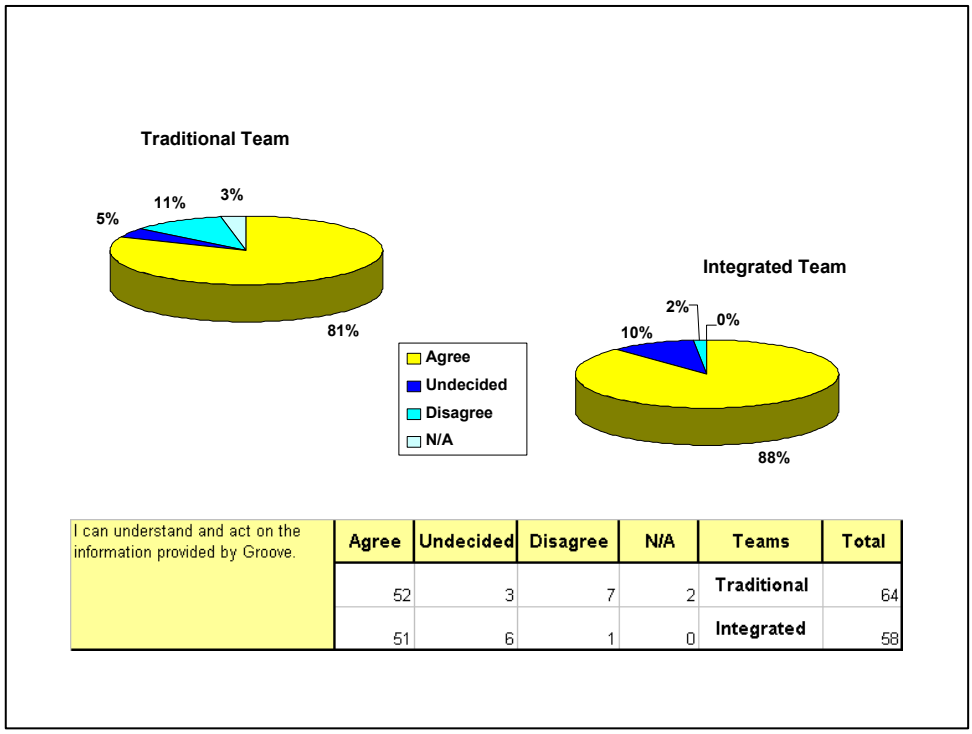
Groove seems to disrupt the way I normally like to arrange my work.	Agree	Undecided	Disagree	N/A	Teams	Total
	10	16	37	0	Traditional	63
	4	18	32	4	Integrated	58

Figure C-13: Vignette Questionnaire Section III, LOE Evaluation of Tools



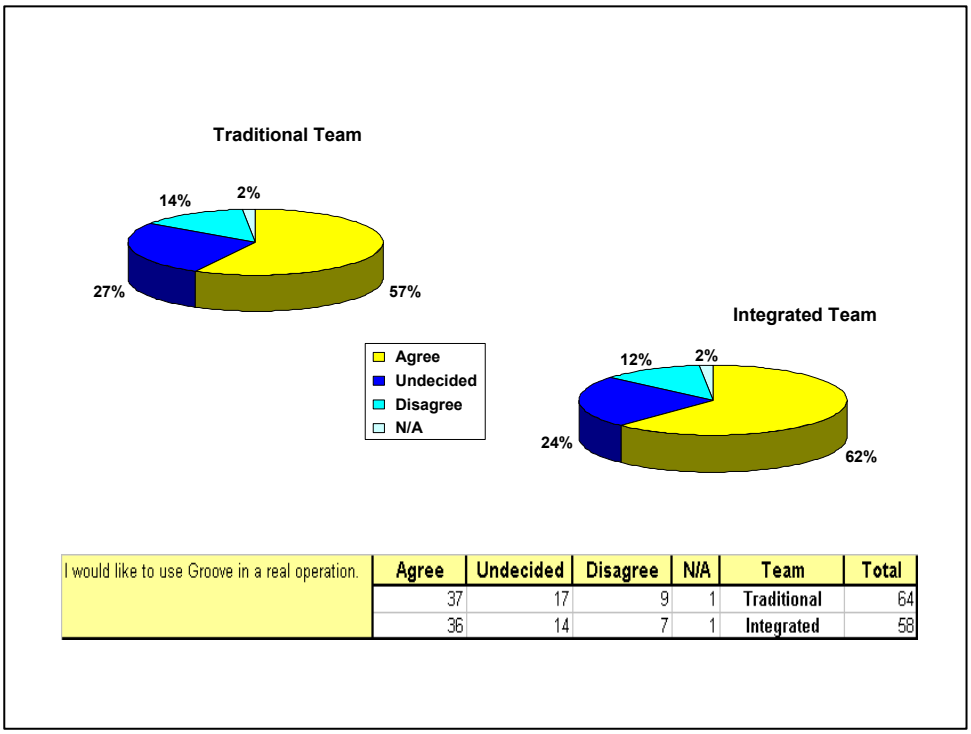
Groove supported the planning process in a satisfactory manner.	Agree	Undecided	Disagree	N/A	Team	Total
	50	7	7	0	Traditional	64
	28	12	19	0	Integrated	59

Figure C-14: Vignette Questionnaire Section III, LOE Evaluation of Tools



I can understand and act on the information provided by Groove.	Agree	Undecided	Disagree	N/A	Teams	Total
	52	3	7	2	Traditional	64
	51	6	1	0	Integrated	58

Figure C-15: Vignette Questionnaire Section III, LOE Evaluation of Tools



I would like to use Groove in a real operation.	Agree	Undecided	Disagree	N/A	Team	Total
	37	17	9	1	Traditional	64
	36	14	7	1	Integrated	58

Figure C-16: Vignette Questionnaire Section III, LOE Evaluation of Tools

The following discussion presents the summary notes and supporting comments from Section II of the Vignette Evaluation Questionnaire.

Traditional Team:

Section II :Process
Collaboration/Process - Traditional

- Leadership was repeatedly cited as a critical factor in the process. Lead Nation determined the process and level of collaboration.
- Various doctrinal (possibly cultural) issues were cited.
- Text chat was definitely preferred over audio.
- Participants had mixed reactions to (amount of) data flow.
- As LOE progressed, team developed Standard Operating Procedures that took advantage of the collaboration tool; process became more integrated.

Overall, team players indicated that the tool enabled the 'Traditional' process to be conducted in a more collaborative manner.

8

Leadership:

•". (LN) lead was a strong one" [E]
• "During the traditional planning process the lead team needs time alone for discussion as I imagine that the lead team is responsible for the plan... there are time blocks where the lead team needs to work on its own... the lead team rules and has to decide somewhere" [E]
• "If the lead team does not listen to input, what is the point in providing it." [E]
• "Planning teams possessed lots of experience which was not utilized by the Lead Nation" [E]
• (Lead Nation) "...didn´t involve others actively in their planning process, own group seemed to be kind observer" – [F]
• "... the (LN) went into a nation huddle for COA development, but that tends to be the way of the traditional planning process…" [H]
• "Planning activity worked better today. (LN) team involved the other nations in their MA and COA development."
• "(LN) again made good use of other nations' planning teams during COA dev.' [I]
• "Lead tried to give out too much of it's own responsibility to coalition partners. " [I]
• "Would help if the leader were to lead...Abrogating responsibility for all the effort does not lead to team spirit. " [I]
• "Leaders lead, supporting nations contribute" [I]

Doctrinal/Cultural Issues:

•"... all teams had different understandings on the necessary level of detail in the planning process" [E]
• "...plan was so lacking in detail - the result is the problems would have surfaced later." [E]

• " And different countries, different opinions about planning…" [E].
• "Seemed that different opinions of the sense of a COA are within the different groups: COA just a step toward the plan." [F]
• "..in some instances though, it was a bit overwhelming to the point that it appeared the UK was actually building a timeline to commence operations.' [F]
• "Some differences over command structures persists" [H]
• "Review doctrine on certain points and insure multinational agreement prior to ops" [H]
• " All lead nations continue to do planning in a different manner. This caused confusion from time to time." [H]
• "Cultural differences not always a positive experience" [G]
• "... think they know it all and try to take over from lead nation". [G]
• "..(LN) managed to resist the tendency to make this operation more than it is." [H] - tendency for heavy use of forces was cited several times
• "... (LN) have got to listen to advice and not storm off with a CVBG' [H]

Audio:

•"Use of chat board, not voice, made it easier to record and develop solution." [E]
• "Discussion was much more open and free flowing in the text chat. " [E]
• "VOICE BARELY USED AS LESS EFFICIENT IN THIS CASE" [F]
• "The use of chat not voice was a positive contribution to the maintenance of the aim" [F]

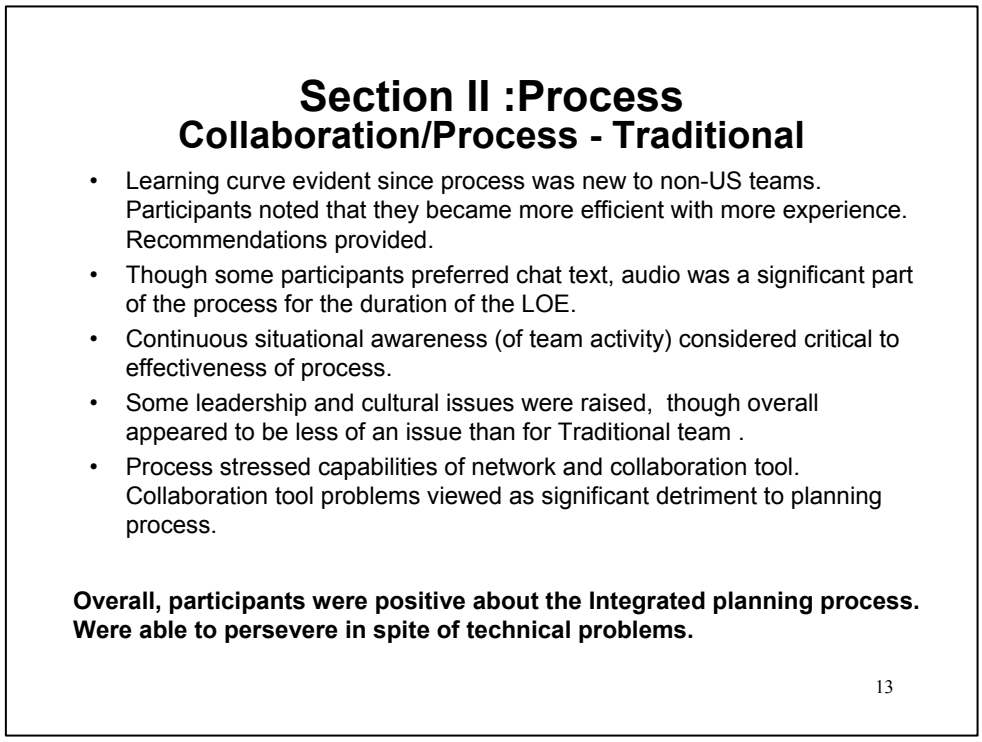
Data Flow/ Situational Awareness:

•"Too many info for the small planning group" [E]
• "You cannot always chit and chat and discuss with the tools at any time…" [E]
• "To many spurious in puts from other nations. No attempt to produce planning teams outside nation groups." [G]
• "Worked well except for 'clap-trap' going on during quiet periods."
• "Continuous data feed provided by GROOVE from unrecognizable sources seriously hampered the intended data flow." [H]
• " The immense amount of information given by so many experts can hamper own consideration flow once in a while. Too many opinions are not always helpful" [H]

SOP:

•Traditional process evolved: "Difficult to use if the traditional planning process will be modified by lead nation without prior coordination with other nations…' [F]
• "Teamwork is improving. We're developing a common language ' [F]
• "Less arguing between planning cells concerning most effective use of each other's assets." [G]
• "Traditional planning cells developed an informal Standard Operating Procedure (SOP) that was developed as traditional planning cells cycled through the vignettes.' [H]
• "...we are beginning to develop standard operating procedures and planning templates that take advantage of the collaborative planning tool"
• "Development of a single planning "stovepipe" instead of one for each national planning cell participating in the LOE. This has cut down on time required to develop conduct MA and COA." [H]
• " The Lead Nation appointed Nations to Lead Components assigned tasks and requested COAs.' [J]
• "US again made good use of other nations' planning teams during COA dev" [I].
• "Coordination and collaboration seemed to work really well today." [J]
• " Ability to coordinate directly sped the MA and COA development. Cooperative attitude and awareness of other teams capabilities increased the speed of development" [J]

Integrated:



Learning Curve:

•" Improved fluency with the system – there is a clear learning curve" [E]
• "I have seen a UK led and now have stumbled through an Aus one. However, both were muddled and would have benefited from actually seeing how it is done rather than learning it by making mistakes." [E]
• "Increasing team rapport and familiarity with processes evident" [E]
• "The US led COA development was good to see. It appears that AUS and the UK's previous attempts were in fact significantly better done than I thought at the time. US took many of our ideas and repeated them. Good confidence builder for future vignettes." [F]
• "There has been a steady increase in participation levels by all nations as personnel have become more familiar with the software and the procedures." [F]
• "... even after x number of exercises, the planning process is still a little mysterious." [G]

RECOMMENDATIONS:

•"Need to develop business rule to alert members to communications failures before too much information fails to pass and SA is affected." [G]
• " Create business rules to drive default to secondary means of communication when team is less than 100% capable of using primary means." [G]
• "closer advisory/business roles recommended" [G]
• "Info management need closer advisory'[E]
• "Suggest we have a formal step agreeing ConOps and COA schematic prior to moving on to discuss remainder of COA template" [G]

• Fixed Agenda: "The tempo of this vignette was too slow. There was too much time allocated to each step of the process, leading to extended periods of inaction. It was evident that extended time to develop MA and COA does not produce better products. " [F]
• "Moved too slowly. Given this is an experiment, need to avoid being unduly wedded to initial process." [F]

Audio:

•"Written chat leads to more accuracy, discipline and shortness" [E]
• " Audio (communications) is unreliable and should be minimized to commands and business roles" [E]
• "Intermittent audio continues to be a detriment to the free-flow of knowledge and idea sharing that forms the basis of effective collaboration. " [E]
• **"**Utilize audio as the primary tool. Use chat as the backup."[G]
• Potential Improvements: "Greater use of audio to discuss conflicts of opinion or confusions with assets etc" [H]
• "The audio allowed me to control the process effectively – without it it would have been difficult to interpret other nations intent." [I]

Situational Awareness:

•"...not sure about effectiveness of team members working in separate places (loss of SA while working in other spaces) [C]
• "Need good comms/ good for situational awareness/ensures ownership of the product throughout/Need to maintain consensus but easier to achieve in this process ."[E]
• "Need to develop business rule to alert members to communications failures before too much information fails to pass and SA is affected." [F]
• "Situational awareness remained high throughout". [F]
• "Situational awareness lost upon occasion when team members employed a tool they did not know (and had no indication of) was not fully functioning or had failed completely. "[F]
• "Lead stated that they were going off line to smooth up the MA. Should have stayed in collaboration to make changes, unless just grammar. Communications was lacking:'[G]
• "Situational awareness allowed rapid changes of lead" [G]
• " Good SA and core teamwork while comms good. When UK needed to take lead we were able to do so because of the high degree of collaboration up until technical probs" [H]
• "Integrated planning relies on saturation of all communications media for parallel and concurrent efforts' [H,I]

Leadership:

•"Poor delegation of tasks within the lead team meant that Intel lead was overtasked (Intel, SF and lead for special COA). The main COA was delegated away from the lead. " [J]
• "Lead stated that they were going off line to smooth up the MA. Should have stayed in collaboration to make changes' [G]
• "Lead nations are focusing on managing collaboration rather than influencing the product…" [J]

Tool Problems:

•"Tool works when there is a small number of players." [C]
• "Any degradation in communications is bound to adversely impact a process based on free collaboration. " [G]
• "Vastly improved communications allowed greater depth of collaboration…" [E]

• "Process is highly dependent upon SOME form of communications with the ability to exchange information in real time. Stumbled badly at first when audio went. Unclear to lead planner when to rely upon fallback method.'[G]
• "Degradation of comms reduced ability to plan interactively" [H]
• "Understand tool is not the evaluation here, but without it the collaboration breaks down and momentum is lost. The planning then turns into a ***one nation (lead) effort"*** [H]
• " When defaulting to the "less than optimum tool suite", the ***process becomes highly traditional in nature,*** the whole process defaulting to whoever happens to be lead and the lead defaulting to whoever can make inputs on the tool." [H]
• "Can't think of any way to de-couple the success of the Integrated Process with the success of an integrating tool. Find a tool that works—consistently." [I]

Overall Satisfaction:

•"Continued use shows that the process is viable " [C]
• "Unfortunately, network problems precluded our involvement in approx.. 50% of the vignette. Nevertheless, once again the collaborative planning process using groove proved an effective planning system. " [H]
• "Staffs continue to plan despite tool failure or degradation." [H,I]
• Strengths: "teamwork…cooperation"
• "The International team has become proficient…" [I]
• "We have all gotten more efficient" [I]
• "The process takes longer to draft but reduces time to agree final draft at the end " [I]
• "All inputs from each nation was considered and put into the MA or COA as appropriate." [I]
• "Today's planning worked very well. Information transfer worked very well and all planners were able to contribute positively. Audio supplemented text chat very well. Network performed superbly and supported vignette." [J]
• "... as a distributed team we seem content with the way of working" [J]

Intentionally Left Blank

APPENDIX D

Team Working and Planning in Coalition Distributed Teams Survey

Johns Hopkins University
Applied Physics Laboratory

Team Working and Planning in Coalition Distributed Teams Survey

- Developed by UK; UK is primary lead for analyzing survey data. The UK analysis effort focuses on human factors.
- APL team generated summary results in order to correlate survey inputs with other process-related data collected during MN LOE I.
- Supporting comments are provided in Notes sections.

MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Johns Hopkins University
Applied Physics Laboratory

Team Working and Planning in Coalition Distributed Teams Survey

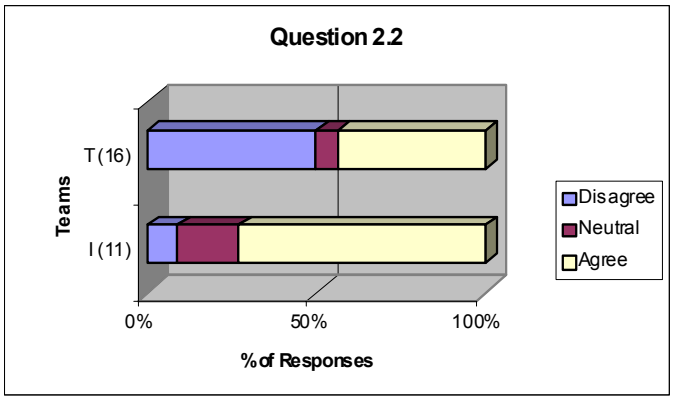
- Survey questions provided a scale of 1-7, spanning Strongly Disagree (1) to Neutral (4) to Strongly Agree (7).
- In the following slides, three major categories are reported:
  - 1-3 = Disagree
  - 4 = Neutral
  - 5-7 = Agree
- Charts report Traditional and Integrated team results separately (total # of completed surveys per team is provided).
- One participant who had worked both processes was included in the ' Traditional' sample.

MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Interoperability

National military doctrine did not differ from the doctrine of other partner nations sufficiently to force an adaptation of usual working practices.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 2.2

Traditional

- "(1) ***Center of Gravity Constructs*** (AU Army doctrine differs slightly from AU "Joint" doctrine but reflects UK, GE and US Joint doctrine - apparently) (2) Format and use of mission statements (foreign tendency is to spell out a mission as a story of bullet points which reads to an Australian like a line-of-operations or a method statement)".
- "THIS WAS NOT A PROBLEM – EXCEPT FOR VERY MINOR ISSUES"
- "All countries had a variation of the same doctrine…"
- "US Doctrine was clearly at odds with NATO Doctrine which US/AUS/GE/UK are supposed to use"
- "Other Nations seemed to want to leap into ***detailed planning*** rather than developing generic COAs to compare and then select for detailed planning."
- "... German planning process was more in accordance with the planning level (***Operational Level***, CJTF) than the others, where the planning was more on the ***tactical level***" (This participant actually worked in both processes)

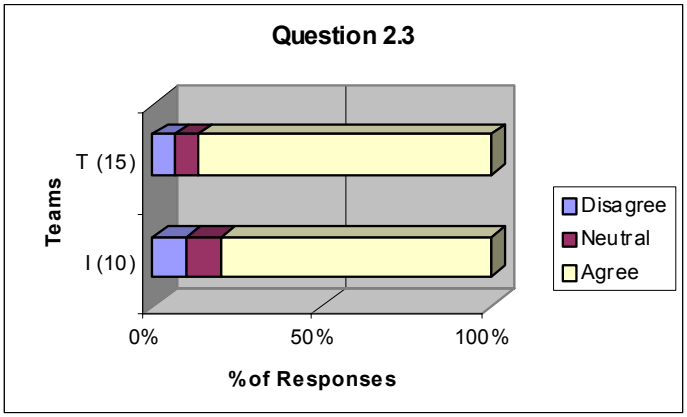
Integrated

- " OVERALL THIS HAD BEEN NOT A PROBLEM – EXCEPT FOR SOME MINOR ISSUES; THERE HAD BEEN SOME DIFFERENCES BETWEEN GERMAN PLANNING PROCEDURE AND NATO GOP."
- "Issues centered around ***rules of engagement and military presence***. Mission analysis was similar except for the way we think about ***centers of gravity***."

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Interoperability

The national cell was very effective in its decision making and procedures



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 2.3

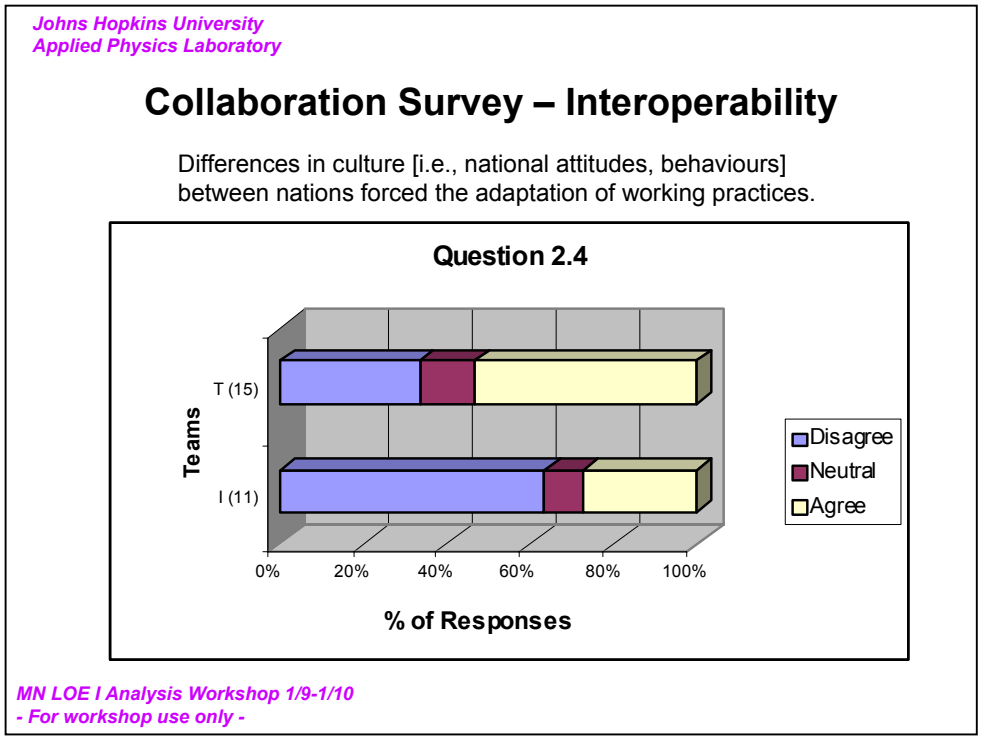
There was some confusion among the participants as to the meaning of the terms 'national' and 'coalition' cells. Survey definitions:
National cell: The national Group you worked with in this experiment
Coalition cell: The international team you worked with made up of geographically isolated cells in the UK, USA, Germany and Australia>

Traditional

- "The team worked very well together and had a broad range of operational experience."
- "SOMETIMES MEMBERS CONCERRED WITH DECISIONS JUST TO GET THE COA DONE IN TIME."
- "At the national level we were all working to the same doctrine, had the benefit of working physically alongside each other and could resolve differences quickly"
- "Due to manpower, system handling problems and different opinion concerning the planning level (see nr.2 above) decision making and procedures were hampered considerably"
- "We did not have a proper mix of personnel." [Participant responded "5".]

Integrated

- "The national cell was not a decision making authority. Having said that the team was very effective because we were familiar with our procedures and we are working in the information sharing end of the planning process the analysis and approval of a COA "
- "ALTHOUGH WE DIDN´T KNOW US, DESCISIONS WERE MADE IN A HIGHLY COMPETENT AND QUICK MANNER!"
- "The process worked for our cell, we were able to blend skills and experience and come up with right answers"
-



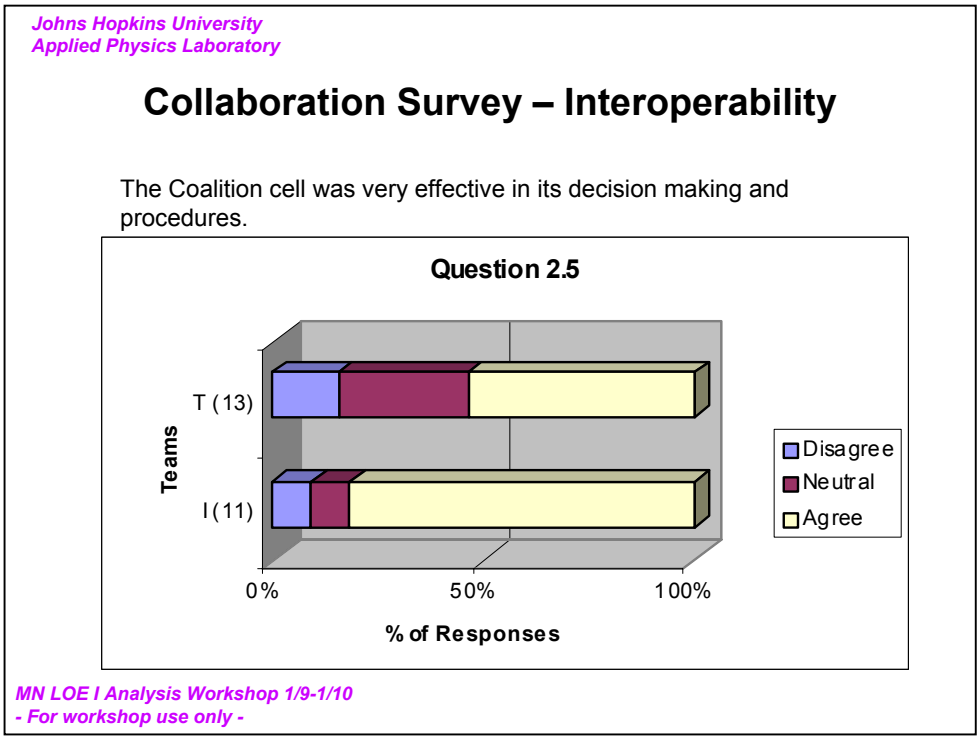
Question 2.4

Traditional

- "...preferred to work in isolation. This made other nations appear redundant."
- *" NO CHANGE TO WORKING PRACTICES BUT CARE IN COMMENTS MADE."*
- "Some nations delegated too far…"
- "…dictatorial leadership…"
- "Because of different planning doctrines teams had to undergo a phase of education in order to understand the different approaches."
- "My way is the best and only way slipped in several times. "
- "...colloquialisms and phrases to non native English speakers…"

Integrated

- All 'Agree' responses were 5 (i.e. slight/moderate agreement)
- "NO CHANGE TO WORKING PRACTICES…"
- "... cultural tendency toward centralization…"
- "... language differences…"



Question 2.5

Traditional

- "Lead Nation concept worked, however the LOE did not test national resolve or commitment, particularly in terms of potential casualties and political issues."
- "...other nations were a little tentative in their leadership…"

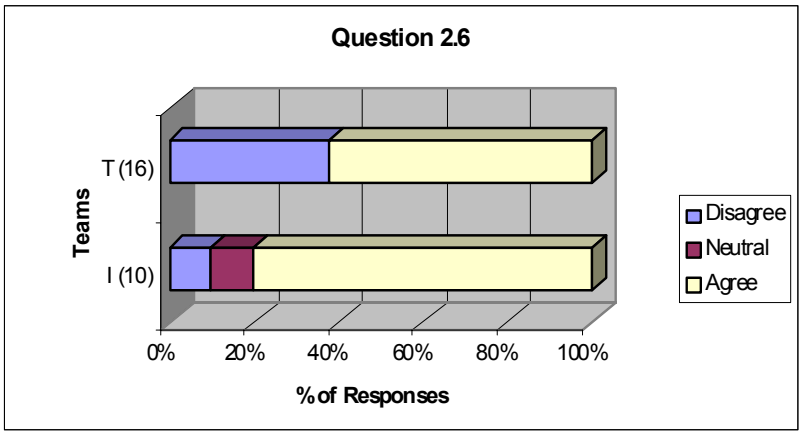
Integrated

- "Other than initial hesitation to exercise a process they were neither familiar with or proponents of, I felt our coalition partners were only slightly hampered in the speed of their decisions, not the accuracy thereof."
- "Considering all the hampering factors (see above) it was understandable that the results could have been better."

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Interoperability

Our national cell did not have to develop new ways of working in order to efficiently interact with the other cells making up the coalition team.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

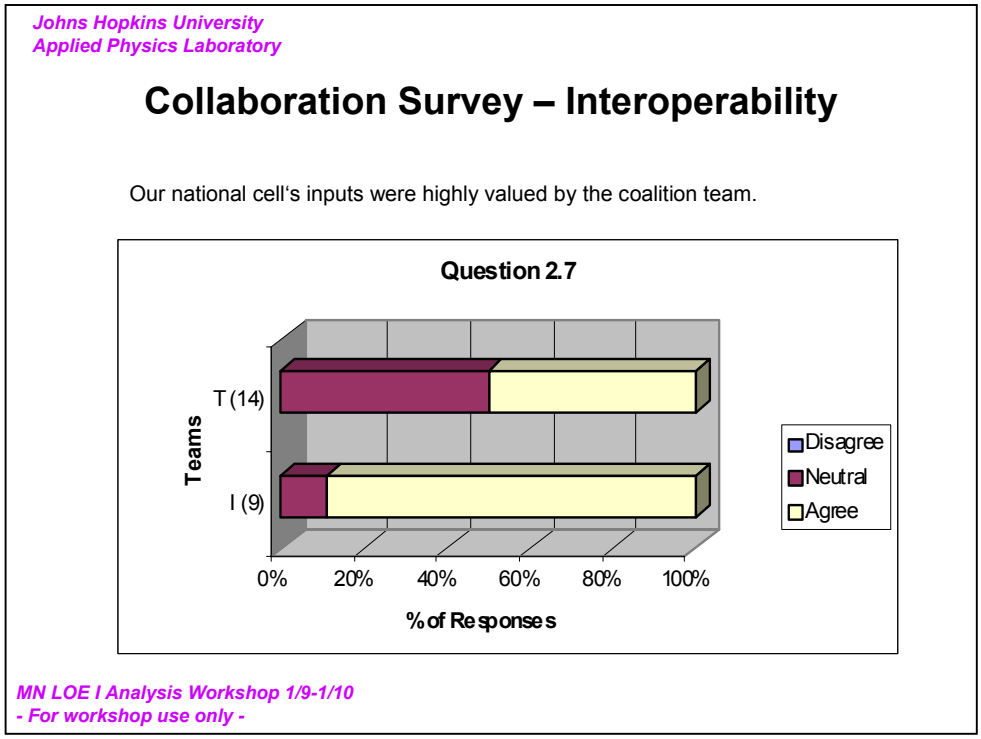
Question 2.6

Traditional

- "... adjusted daily to each nations requirements and over the period of the experiment an 'almost common' procedure was developed"
- "Planning strategy had to be changed during the experiment. The final result was a completely new way to get the work done."
- "Each team had different formats which each other nation used and adapted to. This did not interfere with COA development. There were occasions when MA was delayed whilst nations worked through different document formats. "
- "WE ONLY HAD TO ADJUST IN MINOR WAYS:"

Integrated

- Five of the 9 responses were from the US team, which had the primary lead for the Integrated process, had worked the most with it and each other (i.e., results are skewed by US perspective)
- "Our national cell continued to adjust the agenda, explore different ways to assign the course of action tiger team and leverage expertise in our cell."



Question 2.7

Traditional

- Most of the neutral responses were due to the fact that participants found this hard to assess in a distributed environment.
- "Not able to determine form this end."

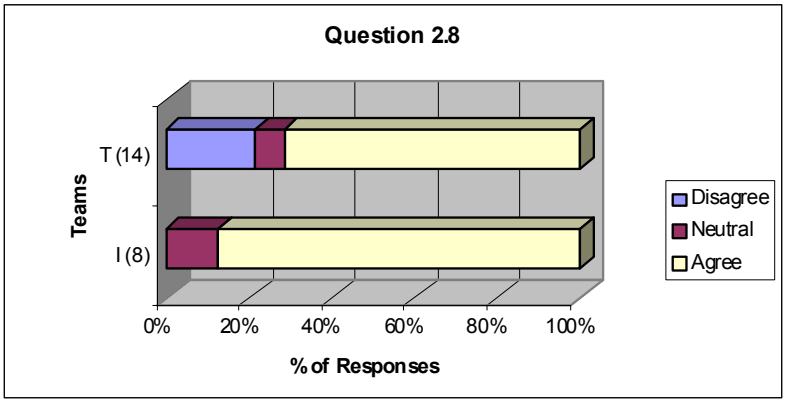
Integrated

- Overall, positive response
- "THIS IS VERY DIFFICULT TO ANSWER! THE COMMENTS OF EVERY NATION HAD BEEN ALWAYS POSITIVE! IF THERE HAD BEEN ANY REMARKS OR QUESTIONS, WE DISCUSSED THIS PROBLEM VIA CHAT AND/OR COMMUNICATION and finally came to a common accepted solution!"

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Interoperability

Our national cell did not have serious disagreements with any final COAs.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 2.8

In addition to the overall question, 2.8 also asked the participants to rate each individual COA from the perspective of whether their national cell had serious disagreements with any of the final COAs.

Traditional

- One participant responded "3" yet rated individual COAs "6" - ??
- "Foreign temptation is to ***overkill.*** The situation. Humanitarian relief distracted them from their mission to maintain a standing ready force for war and they insisted on ***deploying forces that would saturate the disaster area*** making more of a burden than a contribution."
- "On a number of occasions we were not satisfied with the standard of COA produced. ***We believed that they mostly lacked detail***, and were simply very sketchy outline plans with lists of forces."

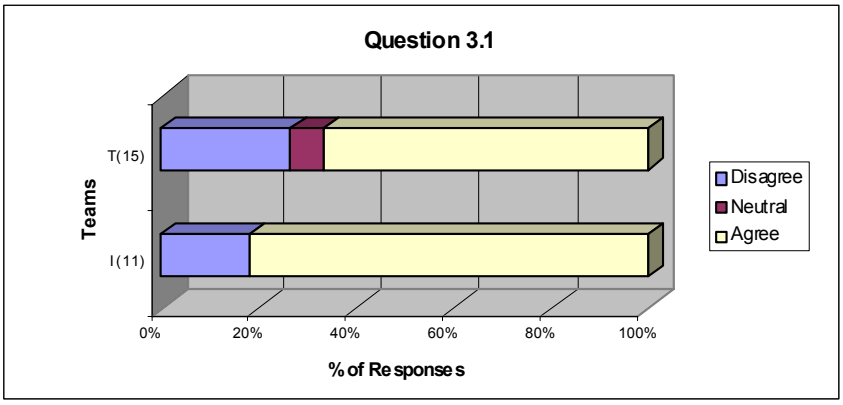
Integrated

- "...the major fault with most of the COAs was that we used too many forces and ran the risk of leaving our 'main' tasks exposed "

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

Monitoring each other's actions as a distributed team was more difficult than monitoring each other's actions in a co-located team.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.1

Traditional

• "In the Traditional process a lot of work goes on in the background as the lead nation develops the COA. ***Distributed team lead can pick and choose the injects it wishes from the contributing nations potentially avoiding the problems.*** If the Planning teams were physically together this would not occur."

• "SIMPLY ***CANT BEAT FACE TO FACE*** FOR ANY DECISION PROCESS."

• "We seemed to know what was going on"

• "GROOVE functioned well in text chat. If lead nation acted as a good chairman and keep other informed as to where documents were located, planning procedures, requirements and objectives the MA and COA development went well."

Integrated

• "Although the system allowed some monitoring it required others to keep briefing 'offline' discussions."

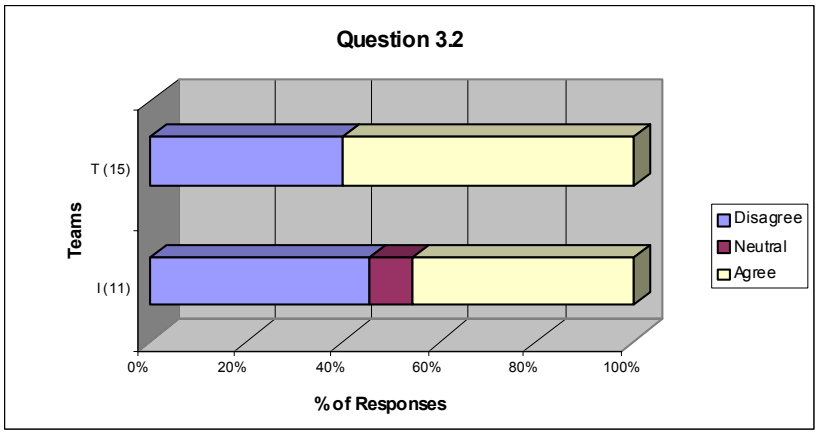
• "Sufficient discipline was evident during the experiment so that there was good situational awareness among the (wider) team. This could easily be compromised if discipline to ensure all were aware lapsed."

• "You cannot see what the other person is doing when he is not talking or typing on the computer"

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

It was more difficult for distributed team members to provide constructive criticism/ feedback on each other's performance, in comparison to co-located team members.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.2

The spread of responses was comparable for the two teams.

Traditional

- "Might be the case generally, however, in MN LOE I, all inputs were dealt with and addressed…"
- "Location did not hinder opportunities to challenge inputs, in fact I was impressed with the candor which was used all around."
- "I can argue in chat just as hard as in person"

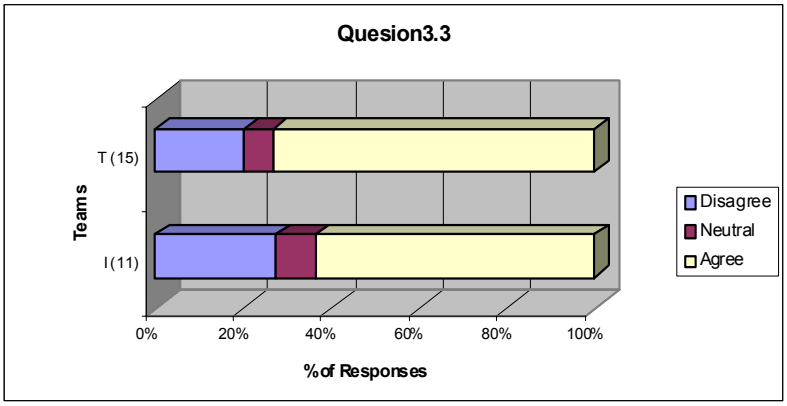
Integrated

- "Comments were freely made, debated, resolved (or otherwise agreed to be left unresolved)"
- "Face to face it is a lot easier to enforce your view and discuss differences, if that view is at the end of a phone on the other side of the world it is a lot easier to ignore."
- "As long as the feedback was accepted then it was used" "

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

It was more difficult for distributed team members to identify when other team members needed assistance, in comparison to co-located team members.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.3

To put this response in perspective one needs to consider 'down time' during the LOE due to network problems.

Traditional

- "It takes longer to detect stress by reading text than by observing an adjacent co-worker"
- "All one had to do was ask for assistance and it was provided."

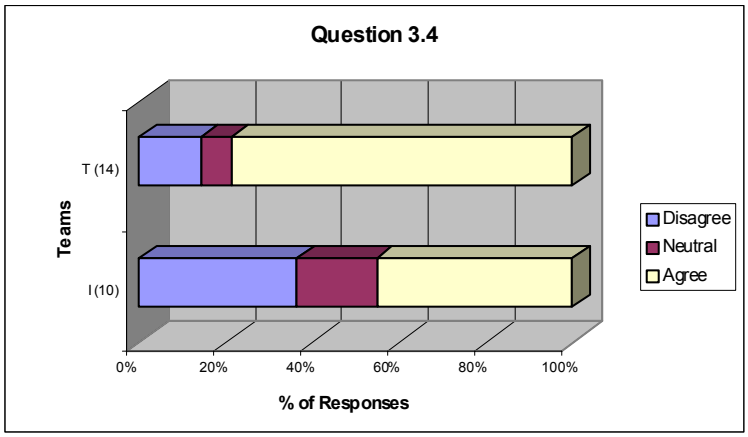
Integrated

- "Distributed teams rely on honesty to call for help"
- "We asked each for help if we need it"

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

Distributed team members experienced more communication problems (e.g. misunderstandings, poor information passage) in comparison to a co-located team.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.4

For both teams, some of the 'Agree" responses reflected concerns about technical communications (i.e. network problems).

Since some of the respondents did not provide insightful comments, it is difficult to distinguish technical vice personnel issues. Regardless of the reason, a larger % of 'Traditional' respondents indicated they experienced more communications problems as compared to the Integrated team.

Traditional

- "Despite the occasional misunderstanding, problems were resolved. "
- "Without links such as video conferencing it is much harder to continue to reinforce a point of disagreement, in the end it is easier to allow the point to go…"

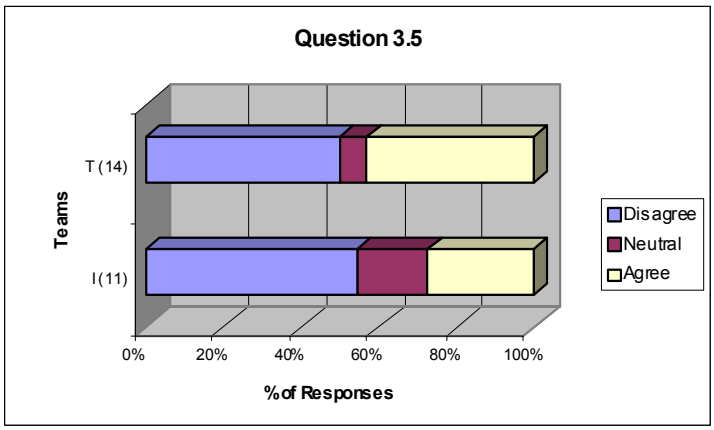
Integrated

- "The problems were limited, as described above. The free flow of chat allowed for clarification questions and they were used ."
- "LIMITED DIFFERENCES ONLY. COMMS PROBLEMS WERE NOT RELATED TO HUMAN BEINGS BUT TO A SOMETIMES NONWORKING WAN SYS"

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

It was more difficult for distributed team members to develop and maintain situational awareness of the bigger picture, in comparison to a co-located team.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.5

For both teams a significant % of respondents disagreed with this statement.

Traditional

- "It appeared that most participants were able to develop and maintain situational awareness throughout the period of the experiment."
- "Within the simple scenarios exercised situational awareness was not an issue. The greater complexity a scenario the greater the chance of a loss of information."
- "It will always be harder when you are not co-located, as different people interpret information in different ways, when co-located this may be picked up, when distributed these differences are often missed"

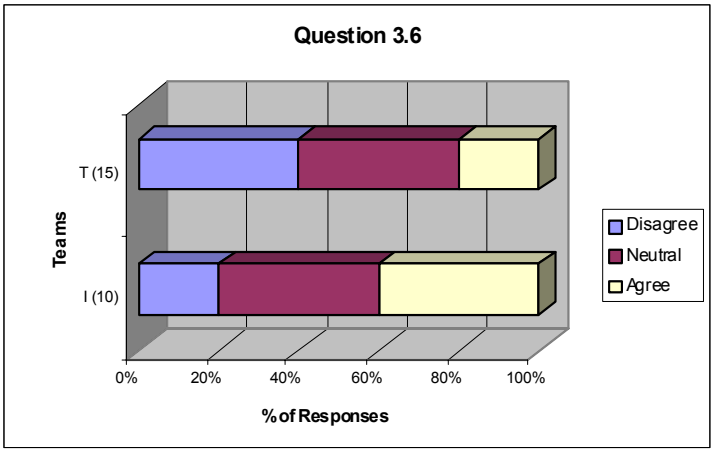
Integrated

- " Situational awareness seemed to be about equal among team members as long as the communications pipes were up and running."
- "OF COURSE! IF YOU CAN´T HEAR THE COMMENTS OR DISCUSSIONS OF THE OTHER TEAM MEMBERS THERE IS ALWAYS A LACK OF INFORMATION."

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

It was more difficult for distributed team members to anticipate the needs and requirements of their fellow members, in comparison to members of a co-located team.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.6

This question appears to be very similar to Question 3.3 yet the responses for both teams were quite different from the responses to 3.3. This questions yielded the largest % of 'Neutrals'. In some cases the comments did not agree with the responses (e.g., some 'Neutrals' appeared to actually agree with the statement.)

Traditional

- **"**With the situational awareness that occurred most participants were able to identify gaps in requirements of other teams and offer comment /suggestions."
- "It will always be harder when you are not co-located, as different people interpret information in different ways, when co-located this may be picked up, when distributed these differences are often missed."

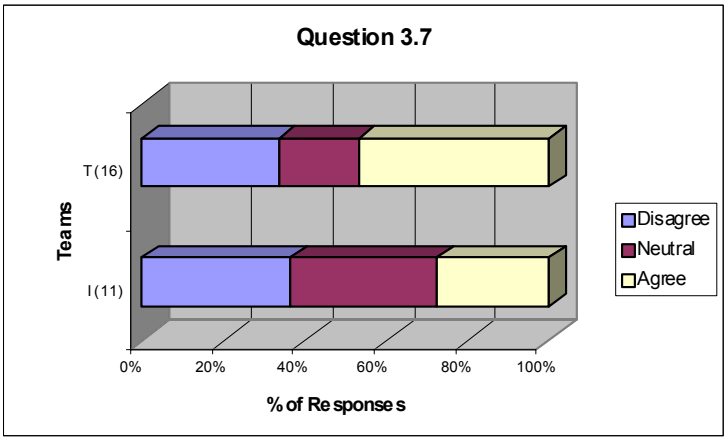
Integrated ('Disagrees' did not provide comments.)

- **"**This was correct early on, but as we became more used to each other and the requirements of the scenario and player's positions it became relatively easy to anticipate fellow members needs"
- "Not as long as the communication system was operational. No difficulties, in fact as the LOE progressed the ability to anticipate each others needs improve as the relationships grew. Functionally we used the same planners for plans, intel, and logistics/force structure for each country. This was not the design it just evolved and proved to increase the skills and efficiency of the planning group."

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

Distributed team members need to possess, or develop, different interpersonal skills to those of a co-located team in order for the team to perform well.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.7

Both teams demonstrated some ambivalence on this issue.

Traditional

- "Essential that personalities are not allowed to interfere. Inter-Team building chat required at times.:
- "The interpersonal skills used are very similar, it is just more difficult to interact with anybody you are not co-located with"
- "Must be polite and patient. Must remember that there are differences in the way we conduct staff planning. Must remember to not use colloquialisms and acronyms when working with nations who speak English as a second language. "

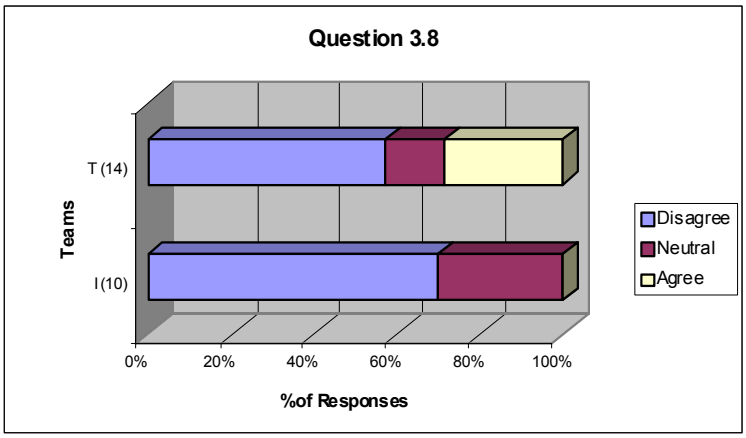
Integrated

- "Clearly, without the benefit of seeing body language the power of either the verbal or written word increases. This requires and increased awareness/sensitivity by all participants."
- "Distributed team members need to possess the ability to communicate both written and orally. Without the face to face interchange, distributed members cannot rely on body language to assist in communicating. This did not arise as an issue during this LOE."
- "Same skills necessary, just a bit more difficult without the body language, etc."

Johns Hopkins University
Applied Physics Laboratory

Collaboration Survey – Distributed Teamwork

It was more difficult to reach consensus over decisions in a distributed team.



MN LOE I Analysis Workshop 1/9-1/10
- For workshop use only -

Question 3.8

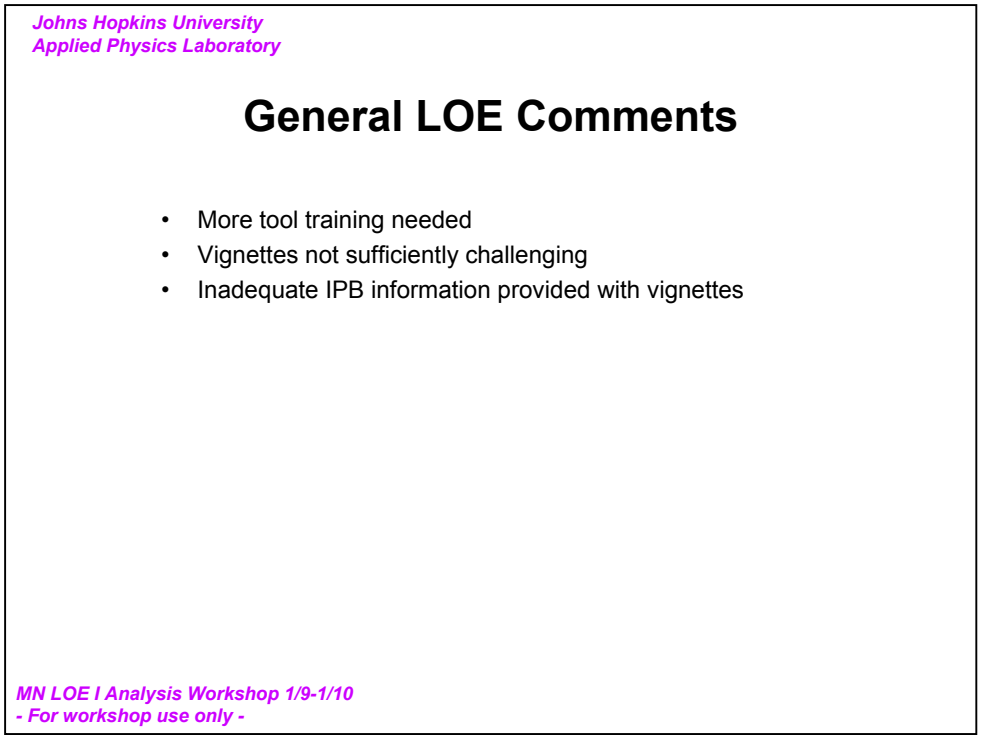
The majority of both teams indicated that it was not more difficult to reach consensus in a distributed environment.

Traditional (Most of the "Agrees" did not provide comments.)

- "The lead nation set the rules!"
- "No more difficult that a co-located team. Our team had just as many consensus issues as the broader team."
- "FOR TRADITIONAL PLANNING WHEN DISTRIBUTED NEED TO ESTABLISH A FORMAL PROCEDURE FOR EACH PLANNING STEP TO REACH CONSENSUS- ON WHAT BASIS ?- WHO IS THE BOSS / LEAD AND WHAT DOES THAT MEAN ?- WHO HAS MOST INFLUENCE ?- IS CONSENSUS REALLY REQUIRED ON ALL ISSUES ?- WHAT HAPPENS IF NO CONSENSUS ?- ETC"

Integrated

- "Keep in mind we are not trying to achieve consensus…"
- "Not difficult at all, easier in fact. It is easier to concur than to be present and see the disagreement in a face."
- "Not really. All of us are used to using radio communications and email as part of our decision making process. "



Majority of LOE-related comments (i.e., tools, vignettes) were provided by the Traditional team.

Come comments regarding the Integrated process:

• "I really doubt that real-life planning in an Integrated Planning Team as practiced here is a way nations will accept to do business. Either you need high-ranking representatives in the team who have the vote to decide on behalf of their nation (questionable as far as, for instance, force generation is concerned) or you end up in a kind of sequential planning again. "

• Another comment offered by a Traditional participant:
"In addition, the United States has got to fix the Operational Assessment Process. The Allies need to have access to ONA or MN RDO will not happen."

• "FOR ME THE WORKING/PLANNING IN THE INTERACTIVE PROCESS HAD BEEN A VERY BIG AND POSITIVE EXPERIENCE."

• "Overall I was surprised at how effective the interactive planning was. I am not sure if the COAs we delivered were detailed enough but I certainly feel that they had ownership from all nations at the time of delivery."

Summary Observations

- No strong trends were observed though the teams did differ on some questions.
- Traditional team noted more issues related to doctrine and cultural differences than did the Integrated team
- Traditional team was somewhat less positive or found it more difficult to evaluate the effectiveness of the National and Coalition cells, as compared to the Integrated team.
- Integrated team found it easier to assess the value of their contributions (given distributed environment) than did Traditional team
- Teams had common criticisms of the COAs.
- Both teams had significant majorities that felt that it was not more difficult to reach consensus in a distributed environment.

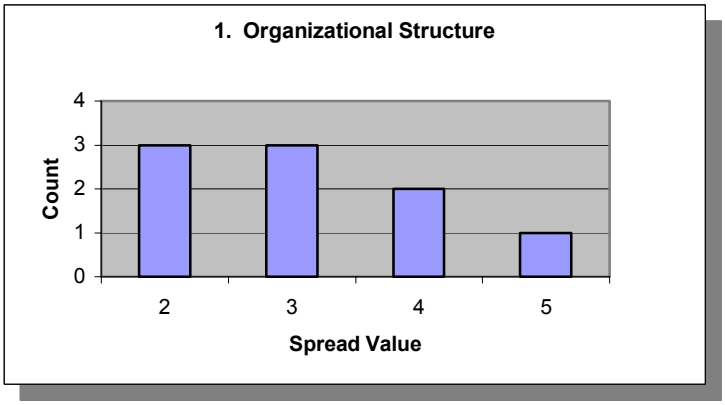
APPENDIX E

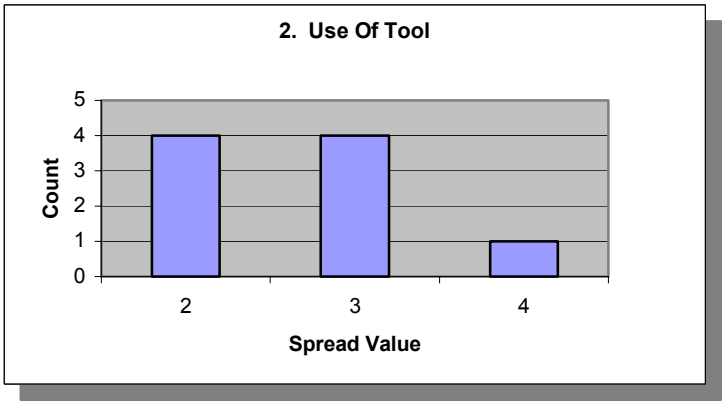
Analysis Workshop Feedback

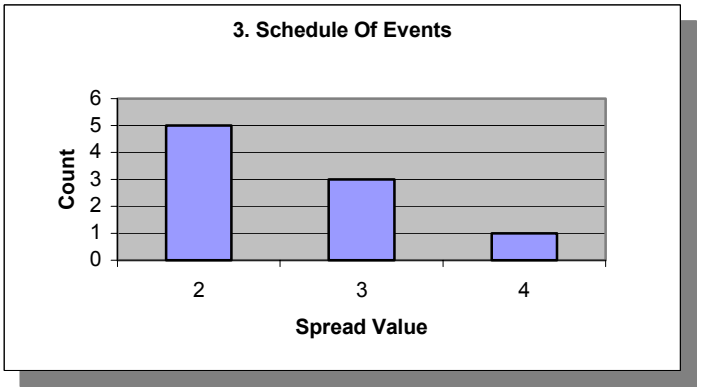
This appendix presents the voting results and comments collected during the analysis workshops.

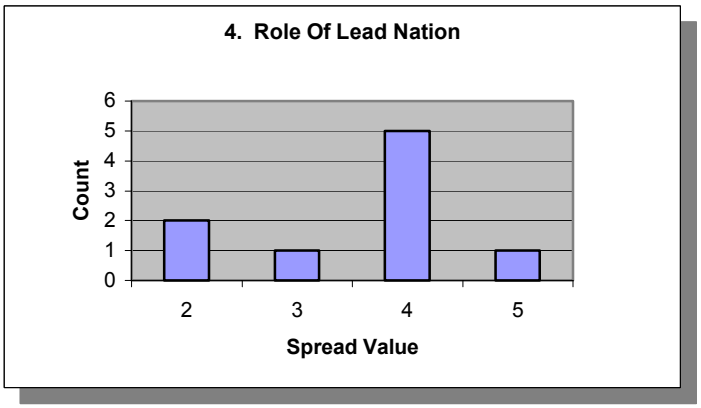
Voting Results: Examination of Process Characteristics Identified for COI #1

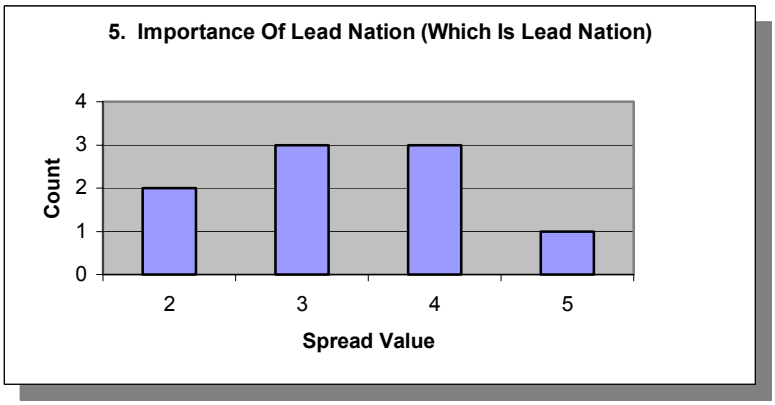
Scale: 1 (Very Similar), 2 (Somewhat Similar), 3 (Different), 4 (Very Different), 5 Unknown

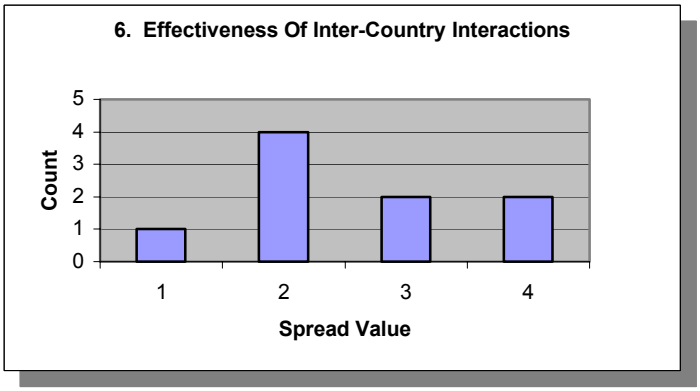


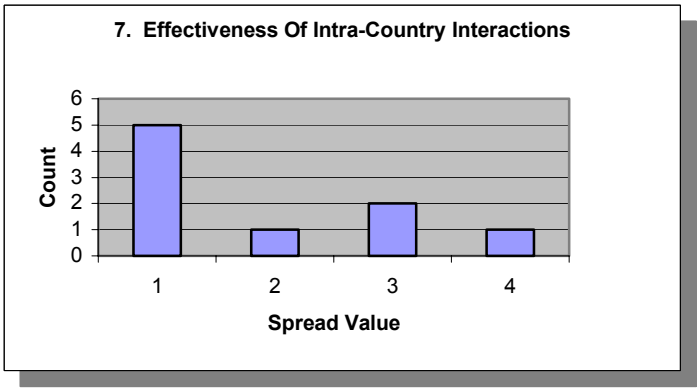


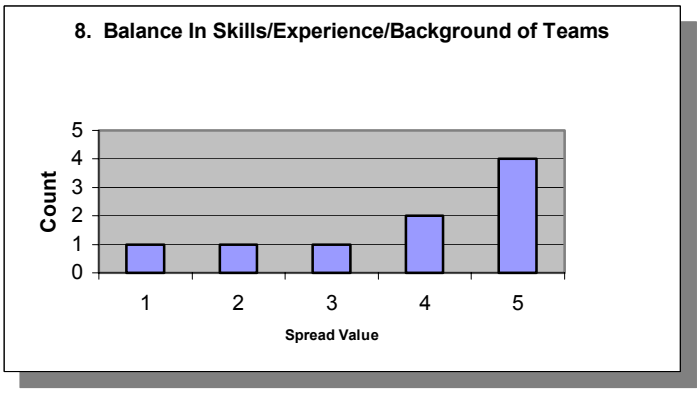







6. Effectiveness Of Inter-Country Interactions
Count
0
1
2
3
4
5
1
2
3
4
Spread Value


7. Effectiveness Of Intra-Country Interactions
Count
0
1
2
3
4
5
6
1
2
3
4
Spread Value


8. Balance In Skills/Experience/Background of Teams
Count
0
1
2
3
4
5
1
2
3
4
5
Spread Value

1. Session 1: Introduction and Overarching Questions

Ann Arnold
JHU/APL
240-228-6639
ann.arnold@jhuapl.edu
APL PM {#9}

Christine Salamacha
JHU/APL
443 778 4976
Christine.Salamacha@JHUAPL.EDU
Analysis Coordinator {#10}

Grace DiPietro
APL
443-778-8617
grace.dipietro@jhuapl.edu
analyst {#11}

Kendall Wheaton
Canadian Forces Experimentation Centre
613 991 6151
wheaton.kr@forces.ca
Observer {#12}

David Connell Operations Research Analyst
Canadian Forces Experimentation Centre
613-991-6141
connell.d@forces.ca
Canadian Observer Cell (Groove evaluation) {#13}

Minor comment regarding the overarching questions: Will the analysis try to answer the question - Which planning process was more effective? or alternatively Which planning process is more effective for particular scenarios? Perhaps the graybeard session will address this. {#24}

Marvin Barnes , Branch Chief, S&T Liaison
JFCOM (J9)
757-836-2834
barnesm@je.jfcom.mil
UK Control {#14}

Christian Jahnke
Bundeswehr Operations Command (BwOpsCom), Potsdam
+49 3327 50 2533
Christian1Jahnke@bwb.org
white cell coordinator at Potsdam {#15}

Keith Curtis
USJFCOM J9/MITRE
757-836-3724
curtisk@je.jfcom.mil
kcurtis@mitre.org
J9 LOE Director {#16}
Wing Commander Davie Paton.
SO1 Battlelabs within the UK Ministry of Defence.
Tel No (+44) 207 218 9938.
E-mail at djwcbmblabs@btopenworld.com.
UK white cell and experiment sponsor for the UK {#17}

Lieutenant Colonel Mark L Jackson
United Kingdom Liaison Officer to United States Joint Forces Command
757 686 7742
jackson_gbr@jwfc.jfcom.mil
Observer in anticipation of participating in MN LOE 2 in Nov 02. {#18}

Chuck Sinex
APL
240-228-5617
c.sinex@jhuapl.edu {#19}

Aus wants to know did the exp. work? Were we able to conduct distributive planning? Session I overarching Questions {#20}

Was the experiment a success? Were we able to conduct international distributive planning {#22}

Yes re #20. We started with some fairly skeptical people and, at the end, I found that they were converted to what we were trying to do. But the proof will be - did the COAs that were produced meet the mail {#23}

Jeffrey Acosta
NATO Concept Development and Experimentation (CDE) Cell (HN-53)
Supreme Allied Commander Atlantic (SACLANT)
DSN: 488-3687/COMM: (757) 445-3687
acosta@saclant.nato.int {#196}

2. Session 2: Process Characterization Data

The dynamism in the vignettes was something that we sought to achieve by not constraining the players with either the hardware or software that they could use {#25}

When characterizing the process, it would be useful to characterize each phase with the mode used (e.g., national or all hands) for each vignette. This would be a simple matrix with phases across the top, vignettes listed down the side with the mode used in the block. {#26}

The cultural aspects may deserve future investigation {#27}

National Staff Training and processes vary; these may be reflected more in the Traditional analysis. The consequence of developing an integrated MN staff process would be the need to create a common training process across all nations. This would have national and inter service cultural implications. {#28}

Was the move within the traditional team to a single workspace vice seperate countries done to alleviate groove problems or to speed up the planning process. Note that this also allowed them to evolve into more of an integrated planning process. {#29}

UK team struggled with trying to follow Lead Nation concepts. {#30}

Brit Traditional Team developed MA template that tended to be used from that point on. {#31}

UK template for traditional side needs to be explored. Refinement of this could be done. {#32}

Traditional team learned from early play. Integrated team did not evolve and try to improve on process. {#33}

Traditional team - virtual workspace by talking with national cell partners. {#34}

GE forced to use just one virtual workspace because of network problems {#35}

Traditional tended to put in more refined products into chat. {#36}

Did constraints of the network restrict traditional development and cause more of a traditional approach since it was difficult to converse with Australia and Germany early on. Did this form the traditional approach at an early stage? Was it more of a "self reliance" which formed the traditional approach? {#37}

UK found it easier to track what was happening with Traditional team rather than Integrated team. {#38}

Chat text - not the same info on the screen at the same time. {#39}

A planning cell located in one nation manned by people from that nation all imbued with that nation's culture and training background will instinctively think alike and act together. Would it be useful to make a comparison with a genuinely MN organization by studying a planning cycle conducted by the ACE Rapid Reaction Corps which is manned by many different nations across all planning/staff cells? By force of necessity, both in peacetime planning and on operations in the Balkans, this headquarters has integrated different military cultures into a single entity. {#41}

Synchronization problem made it difficult to track chat. {#42}

For next Experiment synch all computer clocks (all nations to) Zulu 24 hr time {#43}

RE#26 Cultural aspects are particularly evident in the national planning concepts. {#44}

Integ used audio - traditional did not {#45}

UK Traditional didn't use audio because it slowed down the system- used up too much bandwidth {#46}

When system may crash - Integ team better placed to continue with the plan. If you lost the lead team in Traditional then it was a long time before the lead could be picked up {#47}

Traditional did not use audio in UK. {#49}

Would have handover as shift changes occur during a real multi-day event {#50}

Internal SA within team was a specific area that the UK Human Factors people were looking at= {#51}

Although the LOE scenarios were of relatively short duration, it was noted that in a 'real world' scenario the duration and execution of an event would take place over days/weeks. The traditional workspace was much easier to acquire scenario awareness versus the Integrated team. this has implications for the times when you need to conduct handovers and bring in new personnel. the integrated team's workspace needed to virtually be read in entirety to determine what discussions etc. had taken place and what decisions were

invoked. The traditional workspace effectively used the discussion tool, which was very easy to read into at any point in the scenario. {#52}

A principle of Battle Procedure is Concurrent Activity; even if comms are lost with the Lead Nation the others should continue to work. When comms are re-established then a quick comparison of work should get all back on track. {#53}
Groove spends a lot of time with synchronization. This slows done the system. If someone is off line when they come back there seemed to be system slow downs or interruptions. {#54}
System down? - Which copes better? Depends on time of failure and whom you lose. {#55}

In distributed environment which team is more adversely affected by network problems. {#56}

Traditional again used self- reliance because of issues of connectivity. Any conclusion we reach with regard to multinational flavor should be tempered because of problems that traditional side faced in shared approach. Often connectivity caused the traditional to work independently and then collaborate later. {#57}

A critical phase of any MN operation appears to have been excluded from the time analysis. The time spent by military staff developing COAs may be very short compared with the time the Politicians will take selecting the COA to be adopted and giving the military permission to then develop that COA. The same politicians may well then come back and change it - in effect completely changing the COA. It is suggested that future MN LOEs should include Political Advisers as players. {#58}

Need to compare the time allotted to each phase with collaboration tool performance, vignette duration, and previous vignette topics. {#59}

Planning time questions: do the individual countries (as lead) have any trends? Does the fact that some vignettes mirror previous ones lead to changes in the timings? Planning tended to be fit to the time available via the schedule and not to create a product under a specific measurement factor. {#60}

Unused time is difficult to capture - some time was spent by contributing nations waiting for Lead to return, provide guidance {#61}

Development strategies- (chuck graphs) unused time could also be how much time players in a supporting role are not fully used, sitting around waiting for a task {#62}

Time is less important than quality of product. {#63}

In regard to comment #58 on the Political dimension of COA development, I have assumed that this part of the process was set aside for purposes of conducting the experiment in a fixed period. Was this in fact the case? {#64}

Issue was that planning was done at operational rather than tactical level - hence extensive reearch was not done...not appropriate for the level of planning was assumed {#65}

Need warfighting vignettes for the future {#66}

Open source searching was intended to be used to support the planning processes however; Autonomy and Team Brain were not invoked by the participants to support this objective. {#67}

Beware overclassifying LOEs or saying that a database is classified when in fact all the data in that database is open source to the world either through arms control treaties or CNN! {#69}

Team Brain and autonomy - How much use was made of them? {#70}

Suggest that if you provide a lot of information about Pacifica it is important that the teams get the chance to use what they have learned prior to the experiment. {#71}

Value of Autonomy and Team brain called into question {#72}

Believe traditional went to a common space because of connectivity issues. {#73}

rE #73 - AGREED {#74}

Based on observing the Integrated Team the first week, it appears Groove dropouts affected the Integrated planning process schedule since the Lead nation (1) often waited until comms came back to continue the planning process and (2) could not get results back from their foreign counterparts who had been requested to supply specific planning components. {#75}

Future LOEs must make it very clear at which level each Vignette requires the staff cells to work: Grand Strategic, Strategic or Operational. {#76}

I observed the Integrated Team cells passing a fair amount of planning information by private mail during the first week. {#77}

Groove tool use by traditional - high for threaded discussion and use of whiteboard with annotations was very effective. {#78}

The process on LOE 1 asked the teams to provide only 1 x COA. This unrealistic; military planning teams are required to produce at least 2, usually 3 x COA for the politicians to consider. They usually chose the fourth! {#79}

RE#76 in establishing the level of planning for different vignettes cultural difference in the understanding as to what level of planning is supposed to be done at what level of command. In case of the LOE 1 it was agreed, I believe, that we were operating at the level of MNC. This would in the GE tradition preclude any tactical planning. {#80}

Integrated team was not effective at trying innovative ways to either use Groove or the tools therein. Were the Groove trainers as swept up as they should have been and indeed did their lack of experience impede the use of Groove for this exercise? {#81}

Canada is completing a report on the Groove software for use as a collaboration tool and will forward soonest. {#82}

Appropriate mapping must be readily available to the teams as soon as they are given the problems at future LOEs. {#135}

The baseline of information must be even for all the players in future LOEs. {#136}

3. Session 3: Vignette Evaluation Surveys

Suggest that surveys be given to participants partway through a vignette to get feedback during the exercise. Most surveys at the end were rapidly filled out in order to end the days work as opposed to providing valid input. {#83}

Re #83 Disagree. Too disruptive in mid-vignette. During the vignette they should be concentrating on the Vignette. UK players understood that filling in the Questionnaires were as much a part of the experiment as running the vignette and they stayed until the paperwork was finished. {#84}

Point taken, however some mid-scenario questions can be revealing to the process and the tool use. {#85}

Believe that this best done by Human Factor analysts observing - rather than the players having to break off from their work {#87}

Although not part of the vignettes; problems with the individual tools and/or the Groove interface were handled independently and solutions to these were not shared collaboratively. I found different ways to try to resolve problems when encountered but had no way of sharing this knowledge among player. Separate Groove space for collaborating and sharing lessons learned may have been useful. {#88}
Concern that there was no attempt to ensure parity of skill or experience levels across the Integ and Trad teams internationally. National white cells would try to make teams of equal ability but no attempt made to ensure that one particular job specialization was not pre-eminent in a particular international team {#89}

How swept up were the Groove trainers with respect to handling problems and using the various tools available. {#90}

only 1 member of ea UK team used Team Brain and Autonmoy - danger of drawing too many conclusions from such a small number {#91}

1 person (IT literate) can influence the whole thinking of a national team {#92}

relegated to status of exhibition events {#93}

Brain and Autonomy were not heavily utilized by the players for various reasons; some participants did not access to these tools {#94}

Because BrainEKP and Autonomy were not included in the formal training prior to the LOE, most were not familiar comfortable using these tools. {#95}

Participants like Groove but there is no comparison with any other product. Maybe they would say this about another product. {#96}

The slide on page 32 about Lack of continuous audio being a detriment might look very different if it was shown as Integrated vs. Traditional response {#97}

Vignette Summary Observations stressed the importance of Leadership. However, I am concerned by some of the more detailed comments about the role of the Lead Nation. In MN Ops an essential aspect of, and quality in leadership is to bring your coalition partners along with you. This involves consultation, discussion and sensibility to other nations concerns. Dogmatic direction by one nation is not leadership - rather it will lead to the dissolution of a coalition! Again we are back to training of individuals to understand the nature of MN operations. {#98}

RE#98: Leadership in the case of MN ops should be exercised by giving subtle and sensible directions, rather than issuing stringent directives in order to be able to keep MN players on board. {#99}

Analysis of requirements should be investigated more in upcoming LOEs for collaborative tools. {#100}

It is important that the final report accurately state the caveats surrounding the findings since the sample size was small. {#101}

UK is promoting more involvement of political advisors in LOE II {#102}

Canada would be happy to see a political dimension added to the next LOE as well. This will probably require longer scenarios. {#103}

There must be political scenarios considered but a roadmap of how to integrate this must be laid out now. {#104}

For future LOE I suggest that we look at political involvement (esp for ROE and the other countries involved). We need to be able to experiment on warfighting issues and, by implication, this means that we

have to be able to run classified scenarios - should be OK if we ensure that only the MIC nations take part. Need to be able to do this to maintain the credibility of the LOE (and its process), to demonstrate that we are not afraid to address the issues of interest and to continue to progress on issues of interest along the road to OC-04. {#105}

Ref #105. Not only participation but also Observer status should be restricted to MIC nations only. {#106}

4. Session 4: Collaboration and Distributed Team Working Survey

All Traditional teams used physical whiteboards - not the case for the Integrated team {#107}

It is easy for a small team to integrate; for larger teams this will require the creation and understanding of a simple process. {#108}

This area was not addressed by the Canadian observer cell to any extent. {#109}

Surveys need to be simple and not different surveys. We will do survey X on Monday and survey y on Tuesday. {#110}

Training needs to be uniform. If we do surveys lets do a video or something that is uniform that trains them. {#111}

All surveys must be approved prior to LOE starting. {#112}

5. Session 5: Graybeard Evaluations of the COAs

in an actual incident you would have a much larger team working for several days to produce a COA {#113}

RDO concept - because you do integrated planning, do not need more than 1 COA {#114}

Second bullet, 2nd point - will also find more than can be put into the COA {#115}

US evaluator applied HEAT tool to the COAs {#116}

Headquarters Effectiveness Analysis Tool (HEAT) {#117}

Currently the accepted doctrine of all MIC nations is to present a number of COAs (normally 3) to the senior officers. If the RDO concept of integrated planning will only result in a single COA is to become official Doctrine for one nation, this will represent a fundamental change in MN interoperability which will cause considerable discussions in the other countries. We will also have to acknowledge that politicians do not liked to be backed into a corner by the military by being given only one option! {#118}

If completeness was the primary measure of effectiveness, did the Integrated team receive more positive votes due to the COA development as a team vs the Traditional approach which restricted input, or rather filtered it through the lead nation. {#119}

Perhaps there should be a review of the COAs to see if there is in fact more detail in the Int team versus the Trad team's products. This might explain the lopsided score, in the face of comments that the COAs were fairly equal. {#120}

Does a particular way to derive a COA ie Integ or Trad suit a particular problem {#121}

Is cultural a deciding factor in choosing a planning method {#122}

Are there other MOEs to look at for comparing the 2 processes besides the overall scores from the Graybeard's? {#123}

What factors in HEAT caused US evaluator to choose Integrated every time? {#124}

The point was raised that the processes may be more effective in specific operations - perhaps such as the humanitarian operations considered in the LOE {#125}
There may be a circular process with HEAT. If the J9 participants are familiar with the factors in HEAT, they may have developed their integrated plan to address those factors. Since the US J9 players led the Integrated team for the entire first week, this could have set a strong bias toward generating a plan that would score high in HEAT. {#126}

The vignettes were reasonably similar and therefore was the integrated team better at coming up with a COA given the restricted (low intensity) operations. Some of the questions to answer are: which process is better when planning timing is short? Which process is better for what type of scenario? What process is better suited for particular scenarios based upon the level of intensity? {#127}

Should a weighted factor system be used to evaluate the traditional and integrated planning process? We still don't understand why there was a 2.5 to 1 ratio for integrated. Anyone looking at this will think Integrated is statistically better. The sample sizes are small and two graybeards did not complete the process. {#128}

show Graybeards the summary and get comments {#129}

How much did the Multinationality of the operation weigh upon the Graybeards' selection of the preferred COA? {#130}

The raw data comments are not strongly in support of the graphical results obtained. the subjective nature of the Graybeard decision has not been captured to support the results. The low sample size and the unknown variance further jeopardize relying on the graphical results solely. {#131}

Keith (j) offered to provide the summaries from the graybeards and get their feedback {#132}

What are the characteristics of the COAs for vignettes E and H that all the graybeards chose B as superior, or at least equal. {#133}

Another option is to resubmit the package to a separate group for secondary (confirmatory) analysis. {#134}

6. Session 6: Summary

Comment on the proportion of time spent on MA vs COA between the two teams. First, the total time was fixed. Second, collaboration is an N squared problem. So here is a hypothesis: with a larger virtual team doing MA, it would be expected that the first step will take the larger team longer, and then they would work to complete the second step in the available time. {#137}

There was evolution in traditional process. What we saw was a cherry picking process where those not in lead nation role got to see what worked and what didn't and then try the elements that worked when they took the lead. {#138}

Human Factor people saw a lot of dead time for a contributing (non lead) nation. {#139}

Would prefer the collaboration software support to be characterized as network degradation and periodic loss had a significant impact on Groove performance. {#140}

US lead integrated 4 of 7 times. Does this skew the results since this was not the same ratio for the traditional? US only lead one time in traditional so if US had the lead more times in the integrated then they could have developed a better organizational and decision making process. {#141}

Ref #137. Agreed. Additionally, current UK training stresses that the more thorough the MA the easier will COAs fall out from the deductions. {#142}

It is difficult to rely on time-based measures of effectiveness due to the problems that the experiment had programmed timings and so teams tended to create an agenda at the outset of the experiment and more or less follow that agenda. {#143}

Concur with comment #142, further to that I think it likely that a MN collaboration will develop a better (more complete) MA. {#145}

Did the Graybeards consider the MA for each COA? {#146}

Check the impact of how many times a nation has the lead {#147}

More dead time in Trad - Integ players more involved for longer in the planning process {#148}

Two possible explanations for why the Int. Team's COAs were judged more complete: (1) the US lead most of the time, so the other countries learned the style early on and could then spend proportionally more time working on MA/COA development (see #141), and (2) the Traditional team had more dead time within the experimental timeline, so the Int. Team had a higher level of manpower actively working the problem (see #139). Could be some a combination of both of these, and other factors was well. {#149}

Millennium Challenge 00 used Information Work Space (Iws) - bandwidth was a problem with this exercise too (they had a lot of problems)
They also stopped using voice there because it sucked up bandwidth {#150}

Traditional did not use audio: gap in relay (synchronization), typing forced you to engage your brain, system all ensured that everyone got their input in.
Traditional team vetted material before it was sent off {#151}

With typed (chat, discussion) you had a record of what was said previously. {#152}

Subtleties of language lost for those that English is a second language {#153}

Ref # 150, One of the recommendations from the players was that they would prefer to use PowerPoint instated of the White Board; PPT is band width hungry. {#154}

The Int. Team often stayed off audio because of the bandwidth problem; using notepad as the alternative. {#155}

One factor that was different was the use of voice. Traditional did not use voice. Integrated did use voice. Could this have been a factor that made the graybeards pick integrated? Just looking for differences here. Any comments? {#156}

We need to carefully document the attributes of both voice and text chat and how they were used during the vignettes. This aspect of the LOE may be the most important. {#157}

Referring to comment #154, would PPT be more bandwidth economical if we dropped elaborate backgrounds and complex graphics? Perhaps PPT would be an efficient tool to share drawings if we are only sharing the actual drawing. {#158}

In the UK they had enough human factors observers that the same people could observe the same team throughout. It allowed them to get a better feel for what was going on in that team. {#159}

Some comments regarding the use of voice: when utilized it tended to decrease the level of SA because you will miss the talk if not in the proper workspace, you are busy with something else at the time, you have muted your speaker because you are briefing someone or are on the phone. Lastly, since there is no record of the conversation, you are not sure if everyone received the message. As an outside observer, the text chat allowed for backtracking to review prior interactions and then allowed you to respond. {#160}
If you really want to understand how planning operates in a distributed environment and how to improve it and what kinds of problems are limiting performance, SA of the distributed planning process is a critical factor that needs to be considered in future experiments. It was extremely difficult in this first LOE as an observer at one site to really understand what was going in virtual space between the various country participants. {#161}

Was there more innovation coming out of the traditional side than the integrated side. If so do we lose this innovation if we go to one approach for LOE 2? {#164}

Bandwidth problems can be managed by strict Information Management SOPs {#163}

(Read number 162) We need to separate Groove performance due to network and hardware limitations from shortcomings of Groove tools like notepad jumping when a new entry was made. {#165}

The AUS integrated team started out with {#166}

(Ref #162 and 164) What is the real question that needs to be answered? Which is a better planning process or can we in fact conduct MN collaboration? In my view we have demonstrated that we can do MN collaboration and the use of Groove contributed to this. Therefore, I would support our analysis of the more innovative process, i.e. Integrated, for LOE 2. The traditional side is being undertaken now in real world operations but LOE's are intended to support Olympic Challenge, which is an RDO for the next decade. {#167}

Different - did not evolve into the same process. However - were somewhat hampered by the tool. {#168}

Different - Traditional took on more work level and incorporated at various levels. Different from the strategy of the Integrated team.
Same - more alike rather than each other rather than like classical Traditional process. {#169}

Tool allowed streamlining of process - produced one good COA rather than expend resources on several COAs. {#170}

Is it true that the collaboration infrastructure permits a single COA? {#171}

Re 170 graybeards wanted more than 1 COA from each team. {#172}

Carry LOE planning through to developing OPPLAN {#173}

On the question "did the Trad and Int evolve into comparable ... or significantly different processes", having observed the manual traditional process, these 2 distributed processes are much different. They both involved MN collaboration and being distributed were very efficient. I thought they were therefore more comparable in that context. {#174}

RE 173 - but are we getting something bigger than a LOE? {#175}

OPORD LOE 3 {#176}

A thought is to use MN LOE 2 is a "dress rehearsal" for Olympic Vision 2003 where we could go through the entire planning process. {#177}

Ref # 173. Recommend that LOE 2 should have fewer Vignettes to allow the Teams to go further down the Planning Cycle. {#178}

Vignette development scenarios can be adapted to exercise the whole of the planning process by creating a set of three, one set focused on the initial planning through to COA development, the next piece can exercise the intel - polmil and the last focused on the logistics and Opplan formulation. {#179}
One approach to MN LOE2 is to ask what are the outstanding questions we still have about doing MN operations in a distributed environment, then decide which of those questions are best addressed in MN LOE 2. {#180}

Should we have a complete planning process for LOE 2? Should we bring in experts who work this process? Should we bring in polical members for each team? How many vignettes would we be able to do? {#181}

The real challenge will be to compare and contrast the two processes. I believe we have to do both to present a balanced, objective view. {#182}

Another alternative for LOE 2 could be simultaneous or overlapping vignettes, which are more realistic. I would also recommend that nations be given different timelines to conduct their planning (ie. 6, 8 or 10 hour duration) in order to evaluate the question. When time is short which planning process is more effective? {#183}

Integrated - LN less of a leader rather than a manager. Also was the lead most often for the Integrated process. {#184}

The LOE only examined MA and COA development of the staff planning process. These are the simple parts of the staff planning process. The rest of the process leading to the operation order with "Red Teaming" is where staff planning becomes difficult. For example there was no logistics and strategic movement play. This often results in a COA being discarded. As a result once a COA is decided upon, you MAY see the traditional use "functional" planning, then revert to "traditional" when the staff prepares to publish, distribute, and execute the order. The next two LOEs need to examine this with a "traditional" and "functional" staff as was used during the first LOE. {#185}

Groove predicting 30% reduction in bandwidth with version 2 {#187}

7. LOE 2

Review Classification of the LOE {#191}

MIC nations only as players and Observers - no outsiders. {#193}

Make very clear what level teams are to work: Grand Strategic, Strategic, Operational (will never be tactical) {#195}

Groove needs to have a much better and more efficient data capture/storage/retrieval capability for the analysts in the future if we really want to understand how the distributed process operated.

Start with a clear page of the spaces each vignette

Information Manager for the LOE

Make spaces identifiable as new spaces {#198}

Need a much better data capture and retrieval capability in Groove for the next LOE if we are going to really be able to reconstruct and understand the distributed process. {#199}

Dates of planning conference are February 13-14 {#200}

There is more than mapping needed. Need to review RFIs and other request to determine what scenario information should be available. This would cut down some of the RFIs. {#201}

JHU/APL brief for planning conference required.
Main metrics for LOE II - situational awareness.

Three options: (1) only open source (2) limited release of information (3) significant/extensive release {#202}

Need dedicated observers in each sites {#203}

Control group will have full awareness, vignettes will be used, and surveys will be used to measure situational awareness {#204}

There were significant op tempo issues during LOE I {#205}

If Classification is put at NATO Secret this will incorporate 5 out of the 6 MIC nations. There may well also be a bilateral between US and AUS, or an ABCA agreement, which would enable AUS to join in at NATO Secret. {#206}

Would like to run LOE II on CFBLNet {#207}

During each vignette the level of planning must remain at a constant level. {#208}

See comments under session 6 regarding the vignette design and options to consider. {#209}

Need sufficient level of complexity, warfighting so that planners do not need to go down to tactical level to be kept sufficiently engaged. {#210}

Way to make it complex- make it more real- political issues etc. {#211}

Vignettes should be complex, warfighting, and classified. {#212}

Need to script the vignettes, requires more preparation {#213}

Nations need to ensure that appropriately trained officers are participating in the LOE {#214}

Do we need a CVAT, Red Team or OPFOR to support this LOE? {#215}

Need someone to play to role of Commander during the LOE - someone to answer to - will provide feedback {#216}

could we get flag rank officer? {#217}

Need to articulate the staff skill set as an outcome from the development conference. {#218}

Flag ranked NATO officers {#219}

Skill or experience - Set prerequisites and all abide by these. {#220}

Focus of LOE II will be on the development or use of the ONA {#221}

BEWARE! LOE means EXPERIMENT not Exercise! As more and more demands are placed upon the construct of LOE 2 it seems to sound more and more like an exercise planning conference. {#222}

If SA is the focus of MN LOE2, perhaps a longer, multi-day vignette which progressively builds the elements of an ONA might be a way to get a handle on how SA develops, where the problems are, and the impact of varying levels of classified data that can be released to the participants. {#223}

We had too many resources in LOE 1 - there was no challenge in solving a problem with limited resources. {#224}

Do we continue to have two concurrent processes? {#225}

Look at JWID02 tools for ONA support during MN LOE 2. {#226}

Sub working groups for planning conf for LOE 2 {#227}

End of 1st Planning Conf will have requirements for nat reps to take back to countries to fill {#228}

We must focus on what essentially it is that we want as our test objective. Is to compare two planning processes, or is it to demonstrate MN Collaboration with emphasis on SA, ONA and information sharing? Remember that a traditional/integrated approach is possible within the various country planning cells. {#229}

We also need to assess what each country can contribute in terms of the planning and execution of the LOE 2. The answer may lead us to determine the exact scope that we adopt. Lastly, we need to tailor LOE and Olympic Challenge events towards the long-term goals of this experimentation effort. {#230}

Data extraction must be built into the timeline during the running of the LOE {#231}

Need to upfront coordinate analysis activities; need Analysis Working group established {#232}

Rather than two teams using different planning processes, perhaps one uses two teams with different levels of classified information and compare the impact on the ONA SAs produced by the two teams. Alternatively, one might use one team that starts with no classified data, then add some classified data and examine the impact on the ONA SA, then add an extensive amount of classified data and assess the impact on ONA SA. {#233}

Need the "traditional" and "integrated teams." There is political dimension that must be considered in order to convince multi-national partners some time down the road that they should spend the money, time and resources to adopt RDO. In addition, the LOE must demonstrate that the integrated method is in deed the solution. What if a hybrid is a solution? What if the traditional method can, with the use of collaborative planning and information sharing tools, be used to conduct RDO? Finally, there may resistance to RDO because it is a U.S. initiative which they perceive is being forced on them. The best way to do this is to have the two team provide a valid, empirical evidence that justify spending the time and money to adapt the technologies, and Doctrine, Tactics, Techniques, and Training Procedures required to conduct RDO on a multinational level. {#234}

Need integrated or joint analysis work g {#235}

#235 follow on "work group that incorporates analysis from countries." {#236}

Need to spell out the skills and requirements for the observers who are tasked to look at the SA of the Nat and Internat Teams {#237}

Suggest that we adopt an experimentation hypothesis test versus a set of test objectives. In this regard we would develop a hypothesis (ie. The Integrated Planning Process is more effective at MN collaboration). The experiment is then designed to test this hypothesis through the use of vignettes focused on CROP and

ONA. This approach may then be used to determine how we test such as do we need two teams etc..? {#238}

Could we get joint reservists for the experiment? JFCOM has joint reserve unit. Not ASDW guys (the 1 weekend a month people). Easier to get, you can train them to support this experiment. Services pay for it as training. {#239}
Investigate the use of JRU to support MN LOE. {#240}

Get the schedule out early - outcome of development conference. {#241}

APPENDIX F

MN LOE I Graybeard Evaluation Template

The questionnaire consists of three parts: Part A, Part B and Part C.

Part A asks you to critique the two Courses of Action developed by the planning teams. The COA template provided to the players is comprised of three sections: Section I: CONOPS/Tasks, Section II: Requirements and Section III: Likelihood of Success. The COA template is provided in your package: *MN LOE I COA.doc*.
The Measures of Effectiveness (MOEs) to be considered when evaluating the COAs are suitability, completeness and accuracy. The critical questions to be asked for the MOEs are:

- Suitability: "Does the COA support the Commander's intent and desired end-state? Is the COA acceptable to multinational partners and the host country?"
- Completeness: "Does the COA lack certain relevant and critical information?"
- Accuracy: "Does the COA include errors due to incorrect information or assumptions?"

The following was provided to the participants as guidance for their review of the COAs.

COA Components	MOEs: Completeness	MOEs: Accuracy	MOEs: Suitability
CONOPS/ Tasks	**Factors to consider include:** Omissions of critical actions required to address unique operational situation, critical data sources not considered, specification of chronology of events, etc.	**Factors to consider include**: Use of erroneous data/assumptions or incorrect interpretation of information in developing action plan	**Factors to conside include:** Support of Commander's intent, support of desired end state, consistency with guidance/checklists provided in Joint Doctrine publications, etc.
Requirements	**Factors to consider include:** Omissions in support requirements, critical data sources not considered	**Factors to consider include:** Errors in determining impact of COA on Pacifica mission, Errors in assessment of MNF capabilities/resources, Errors on assessment of host country capabilities/resources	**Factors to consider include:** Impact on ability to support Pacifica operation
Likelihood of Success	**Factors to consider include:** # of (known) risks not considered, omissions in understanding of enemy vulnerabilities, omissions in understanding of MNF vulnerabilities	**Factors to consider include:** Validity of assessment of host country objectives and response	**Factors to consider include:** Consistency with relevant ROEs and doctrine; MNF support for the COA; likelihood of COA to succeed; Number of constraints impacting success of COA; Flexibility to accommodate redirection

Factors to Consider in Applying MOEs to COA

Reviewers are asked to identify any and all deficiencies, relative to the specified MOEs, noted in each of the three major sections of the COA. The reviewers are also asked to rate each deficiency using the following scale:

- 1 = Minor deficiency; *could have* some adverse impact on operational effectiveness of the COA
- 2 = Moderate deficiency; *will likely* have adverse impact on operational effectiveness of the COA
- 3 = Significant deficiency; *will definitely* have adverse impact on operational effectiveness of the COA.

For each COA you are provided three text boxes that correspond to the three sections of the COA. In each text box list the noted deficiencies. Please label the deficiencies as a., b., c., etc.. For each deficiency, specify the applicable metric(s) and assign a weight.

Codes for metrics: C = Completeness
A = Accuracy
S = Suitability

Codes for weight: 1,2,3

Example:
Section I: CONOPS/Tasks

a. COA failed to accommodate for the following activities related to the evacuation of displaced persons:. (C) (2)
b.

Section II: Requirements

a. COA did not sufficiently address requirements associated with in-country transport of displaced persons. (C) (1)
b. COA has incorrect assumptions regarding host country capabilities and resources. For example… (A) (2)

Section III: Likelihood of Success

a. COA timeline too long to satisfy commander's need in an operational situation such as this. (S) (3)
b.

Part B asks you to make a comparative assessment of the 2 COAs.

Part C provides space for further comments you might wish to make.

MN LOE I Graybeard Evaluation: Identifier Information

Completed by:	
Vignette ID (e.g., C)	

Thank you for the taking the time to complete this questionnaire.

Part A: Course of Actions Evaluations

TEAM A:

Section I: CONOPS/Tasks

Section II: Requirements

Section III: Likelihood of Success

TEAM B:

Section I: CONOPS/Tasks

Section II: Requirements

Section III: Likelihood of Success

Part B: Comparative Assessments

As a commander, which COA would you select? Please provide the rationale for your response. If you would not select either COA, please indicate so and provide your rationale. If you consider the two COAs to be essentially comparable, please indicate so and provide your rationale.

Please provide your response and the associated rationale.

Part C: Other Comments

If there are any other points you would like to raise about this vignette, either about the planning products or the vignette itself, please do so.

Please provide other comments.

Once again thank you for taking time to complete this questionnaire.